

THE IRON AGE

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THE IRON AGE

New York, Thursday, April 23, 1908.

The Hebb Coke Drawing Machine.

Engineers connected with beehive coke oven plants have expended a vast amount of effort in recent years on the development of machines for drawing coke. The desideratum is naturally a machine that will be adapted to such plants as ordinarily constructed and the operation of which will not be injurious to the ovens, while at the same time a maximum proportion of the coke is removed without the employment of hand labor. Several coke extractors have been described previously in these columns. The present article deals with the Hebb coke drawing machine, the invention of John A. Hebb, Uniontown, Pa.

The first trial of the Hebb machine was made at the

Laughlin Steel Company. It had greater weight and strength than any of its predecessors, while retaining certain features of the old machine, and for some time has been operating successfully in extracting and loading coke at the Second avenue plant in Pittsburgh of the Jones & Laughlin Steel Company.

Views of the Hebb machine are given in Figs. 1 and 2. In Fig. 3 is an elevation of the machine, and Figs. 4 and 5 show different positions of the scraper in the coke oven preliminary to the drawing of the coke. The machine combines an extractor and conveyor mounted on a single truck. The various operative portions of the machinery are carried by a turntable mounted on a circular track on the upper part of the steel framework. The principal

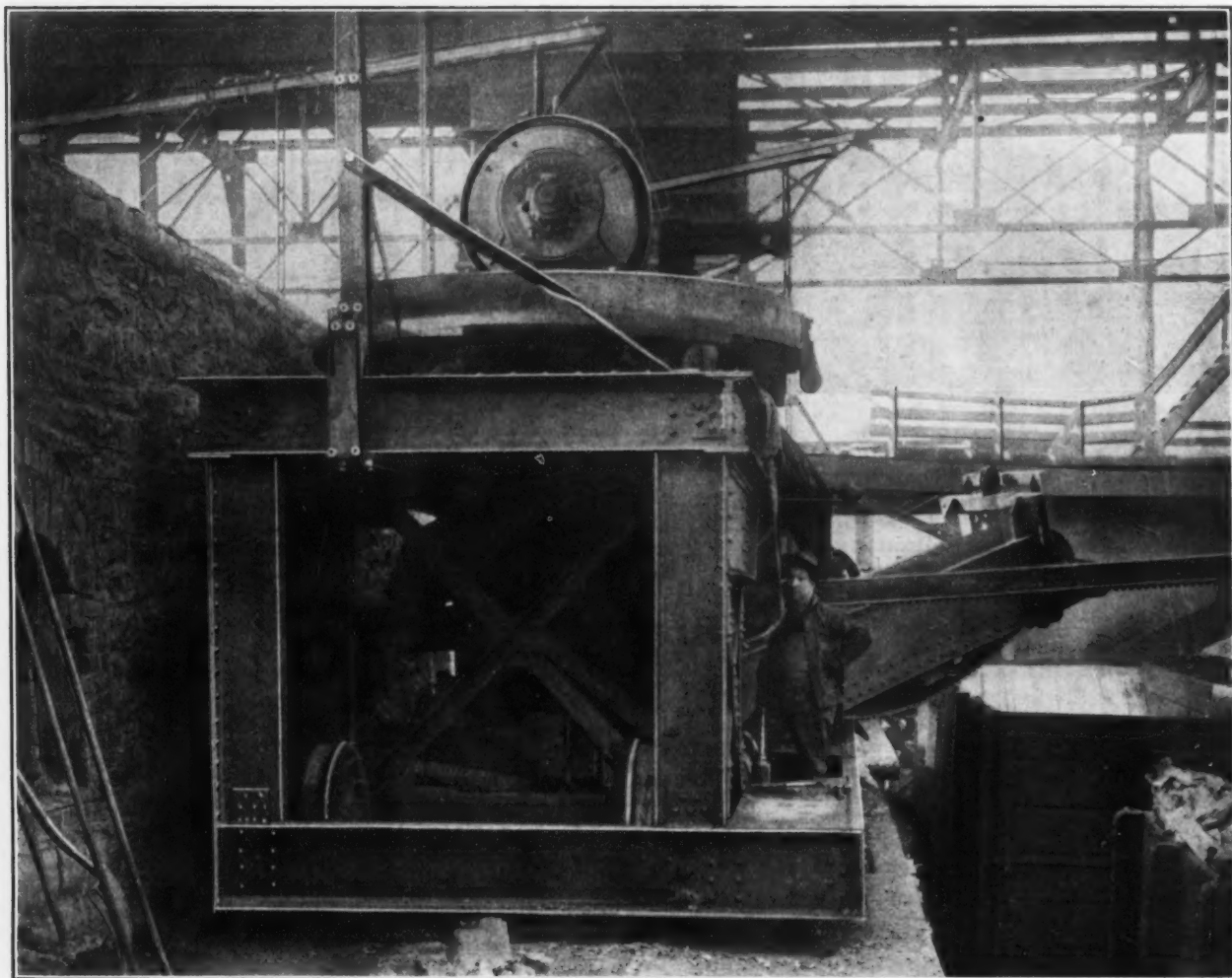


Fig. 1.—The Hebb Coke Drawing Machine in Working Position.

plant of the Stewart Iron Company, Ltd., near Uniontown, Pa., in 1900. Six years before that time Mr. Hebb had begun working on the idea of machine drawing of coke. The test referred to was not satisfactory, and the next was made a few months later at the Hero Coal & Coke Company's plant, Smock, Pa. After some changes the machine was taken to the Brownfield plant of the H. C. Frick Coke Company in September, 1901. Six months later, after a remodeling, it was tried at the Oliver plant of the Oliver & Snyder Steel Company in the spring of 1902. Soon after a heavier machine, weighing about 7 tons, was built and taken to the Continental No. 1 plant of the H. C. Frick Coke Company. While its operation was successful, the construction was such as to necessitate considerable repairing. A new design was then brought out and a machine constructed for the Jones &

working member is a beam supported from the turntable and having at its forward end a pivotally attached scraper head. The scraper folds back under the beam as it is pushed forward into the oven over the top of the coke. It is extended at practically a right angle with the beam by the tension of a spring on the back end of the beam, a rod fastened to the scraper running through the spring. The forward end of the beam has a shoulder against which the body portion of the scraper bears under tension of the rod, thus limiting its movement. When the scraper end of the beam has been pushed to the innermost part of the oven and lowered on the coke the beam is rapidly reciprocated and a crevice is opened in the coke into which the scraper is lowered, as in Fig. 5. The beam is then withdrawn and a large portion of the coke is pulled out on the conveyor, which carries it directly

back from the oven door and drops it into cars. The breakage is thus very slight. The beam is then advanced again into the oven and the operation repeated until the coke is drawn.

The aim has been to provide the mechanism for all the movements of the human coke drawer. Three motors supply the power for the operation. One gives motion to the extractor, another drives the conveyor and through a third the machine is moved along the track in front of

ing it, swinging it from side to side, as well as moving the machine forward and backward on the track and controlling the operation of the conveyor. Emphasis is put on the strong construction of the machine and its simple arrangement. Spur gears are used in all cases, with the exception of one pair of miter gears. All the machinery except the conveyor chains is out of the dragging dust. The frictions on the machine make it less liable to damage the ovens than any positive application of power.

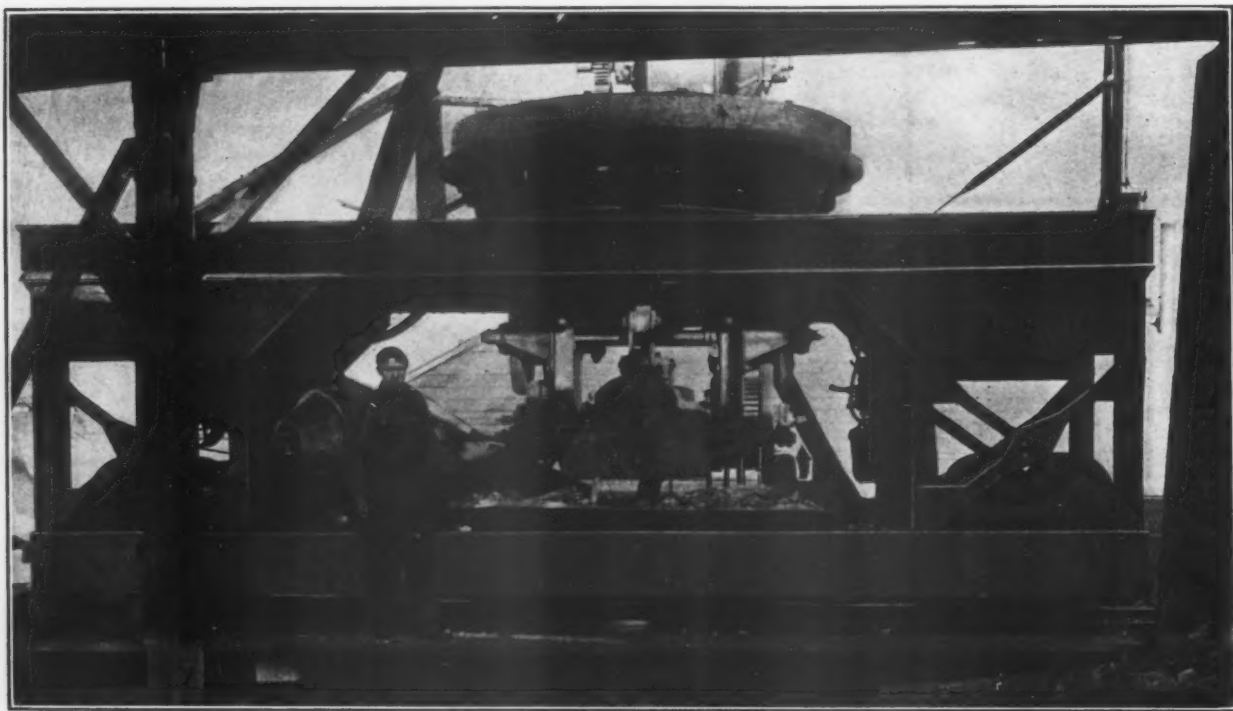


Fig. 2.—Front View of the Machine, Showing Scraper.

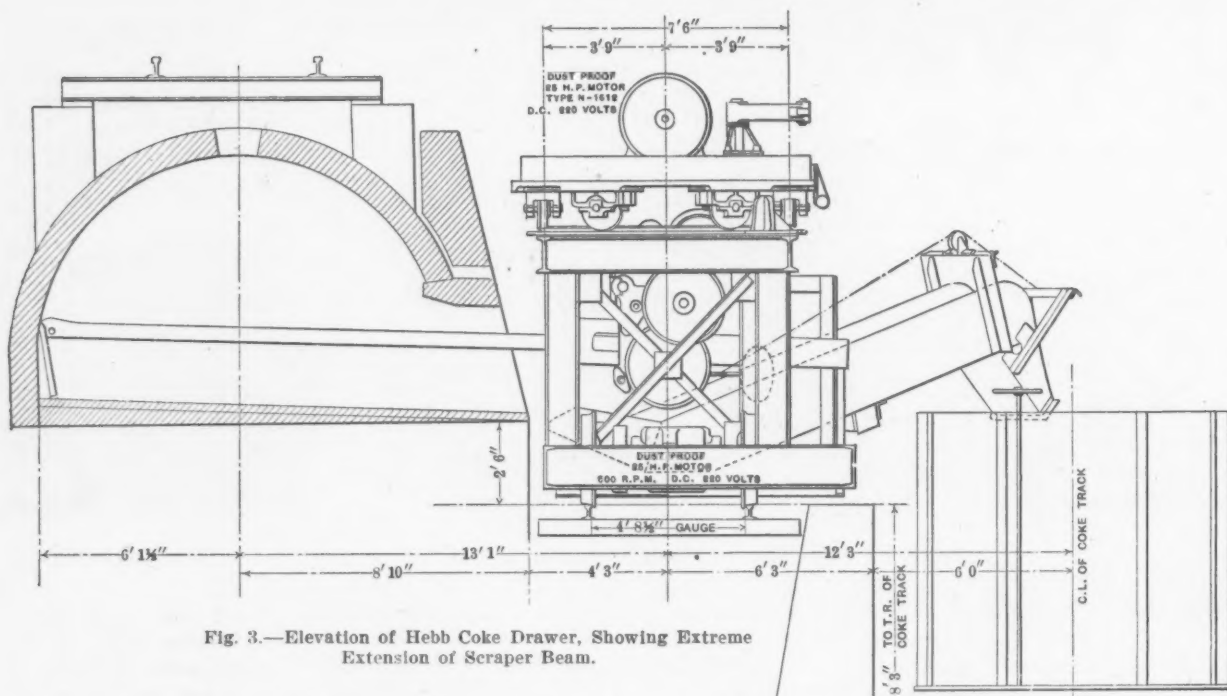


Fig. 3.—Elevation of Hebb Coke Drawer, Showing Extreme Extension of Scraper Beam.

the oven. The conveyor consists of an inclined trough mounted, as shown, on the same truck as the extractor. It consists of a series of slats carried by sprocket chains. Through the spaces between the slats the ashes and fine coke drop, and near the upper end of the trough is a short ash chute for this refuse. The conveyor has a chute overhanging the car, and this can be raised or lowered to deliver coke at any angle. This is done by a roller with a rope attachment, and thus adjustment can be made to different heights of cars. The operator makes these adjustments. One person controls the mechanism for raising or lowering the beam, advancing or withdraw-

Based on its performance thus far, it is estimated that the Hebb machine will draw an average of five ovens an hour. The principal advantages referred to are the reduced cost of coke manufacture made possible, the increase of production through the saving of time in drawing, and prompt ignition through the saving of heat retained in the oven and thus a saving of time in burning; there is also the large independence of hand labor made possible, an advantage particularly emphasized in the summer season, when the work at coke ovens is most exhausting and workers are often obtained with difficulty. Under the best conditions work at coking plants is try-

ing, and on this account the coke drawing machine, like the pig iron casting machine, is a highly desirable innovation. For the Hebb machine economy of labor in operation and of maintenance is claimed, and the further advantages of drawing the coke in its natural size as coked, of meeting the ordinary conditions of yards and ovens, of delivering the coke in a straight line from oven door to cars in good condition, of removing substantially all the coke from the oven, and of causing no more wear and tear upon the structure than results from hand drawing. The builder of the machine is the Hebb Coke Drawer

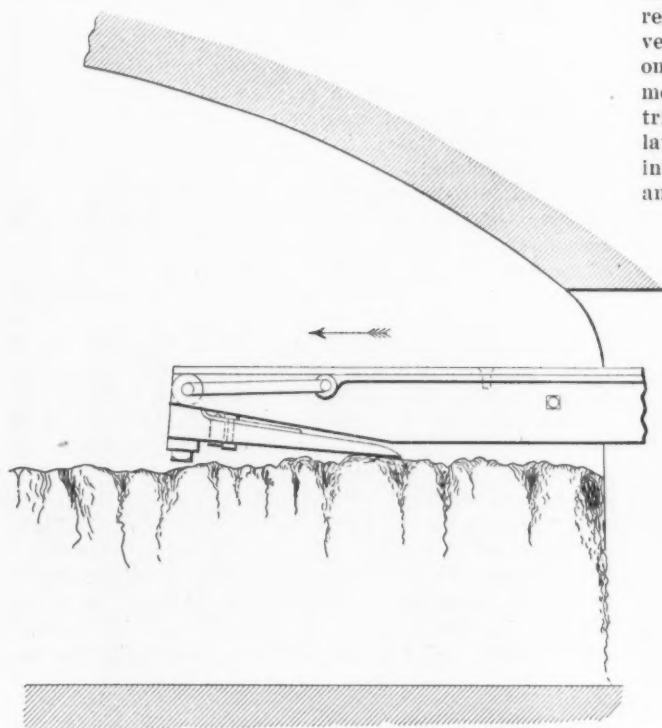


Fig. 4.—The Scraper Depressed Backward, as it Comes in Contact with the Coke on Entering an Oven.

Company, Uniontown, Pa., L. L. Hiller, Pittsburgh, president.

The Protection of Workmen Against Accidents.*

BY CHARLES E. LUCKE, COLUMBIA UNIVERSITY, NEW YORK.

There is ample proof that the number of personal injuries and deaths from accidents in this country is unusually large. Any movement that has for its object the protection of the person, whether directed toward those engaged in their daily occupations or toward the general public, should receive the support of every good citizen. In order, however, to justify such support the remedies proposed should be sane, reasonable and free from mere sentimental impulse. It must be shown that some accidents are avoidable and that the preventive measures are not oppressive. This broad problem is not by any means a simple one, and its solution involves a divisional classification. One of these groups of cases in which I am more particularly interested is concerned with the protection of workmen engaged in producing and operating machinery. All work with tools or machinery or that involves the moving of heavy weights, the inhalation of harmful dust or gases is by its very nature essentially dangerous. The source and nature of the danger is, moreover, best known to the interested parties; that is, to employer and employee, and needs no demonstration by statistics or by kind hearted philanthropists.

It appears, therefore, that a reduction of accidents to workmen of these classes may be brought about most easily by common consent of both parties to adopt preventive measures, and one strong contributing factor to this co-operative action is the existence of such a museum of possible devices as is here in course of establishment. It may be, and probably will be true, that in many

cases employer and employee cannot agree. The workman may refuse to use a device that would protect him, because it may be annoying to him in his work, and he prefers to take the chance of injury rather than be bothered, or it may be on the other hand, that means for rendering the occupation of his men more safe will involve a prohibitive cost on the part of the employer. He is in business distinctively to make money, and if he cannot make money or should his profits be reduced by prohibitive appliances or methods he will close his works. Between these two extremes of refusal to accept a remedy on the part of the workman, and the refusal to adopt the remedy on the part of the employer, I believe there is a very large middle ground, involving perhaps a forcing of one or the other party, perhaps by gentle educational means, perhaps by legal enactment. This museum contributes to the former, employers' liability laws to the latter, but perhaps better than either of these alone, but involving both of them, is the means offered by liability and accident insurance.

If the insurance companies can be induced to grant

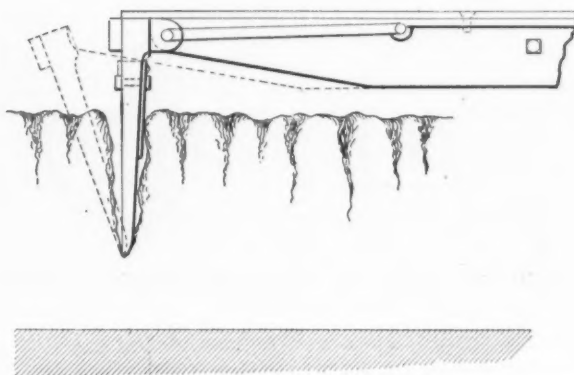


Fig. 5.—The Scraper Extended at Approximately a Right Angle to the Beam and in a Position to Draw.

to the employer lower liability rates and to the workman lower accident rates for the use of this or that device, it will appeal most decidedly to the employer as it touches his earnings, on the one hand protecting him from damage suits and on the other hand giving him his protection for lower rates to permit the purchase and maintenance of the safety appliance, and it will appeal to the man carrying accident insurance in an equally obvious way. Before any safety device is adopted its true nature—that is to say, the precise extent of the protection it affords, must be determined. Safety appliances may be more harmful than useful when by lulling into a false security by promises of protection, there results a relaxation of vigilance that is the surest protection, with perhaps a failure of the appliance at a critical time. A safety appliance is not a safety appliance because its inventor asserts it to be such, but becomes a safety element only when it has been proved and tested and when it has by use proved to be absolutely reliable. To accomplish this a series of tests must be made by a thoroughly reliable and disinterested party, such as are made, for example, on fire protection appliances in the laboratories of the Fire Underwriters and at the laboratories of various technical schools, but whatever tests are made the results must be widely published for the general information of the entire public. To sum up the problem as it appears to me as a mechanical engineer, there is no necessity for the proving of the danger of the occupation to either the man engaged in it or to his employer. Every sort of appliance for removing danger must be invented, tried, tested, results made public and the successful appliance placed on exhibition, together with the results of the test to assist in bringing about common consent for its use between employer and employee. Without common consent, one or the other may be forced, and in this forcing process educational policies, employers' liability laws and accident or employees' liability insurance practice are, I think, the most potent factors.

* An address delivered at the opening exercises of the Exposition of Safety Devices, New York, April 11, 1908.

The Whitlock Double Lap Pipe Joint.

The joint for high pressure steam piping shown in the illustrations is of the class in which the pipe itself is flanged outwardly to form the contact surfaces and requires no gasket. Loose rings surrounding the pipe and backing the flanges, when drawn together by bolts, clamp the flange faces, forming a tight joint. The joint is distinguished from others of its kind by the extra thickness of the flange, whence is derived the name—double lap joint. While the process of forming this flange is not made public by the manufacturer, the Whitlock Coil Pipe Company, Hartford, Conn., what it accomplishes may be described as consisting of double lapping the end of the pipe. During the flanging process the metal is upset at the root of the flange, so that the flange itself is stronger than the body of the pipe. This method of flanging provides the strength necessary in high duty service. The flanged portion is made wide enough to extend to the bolt

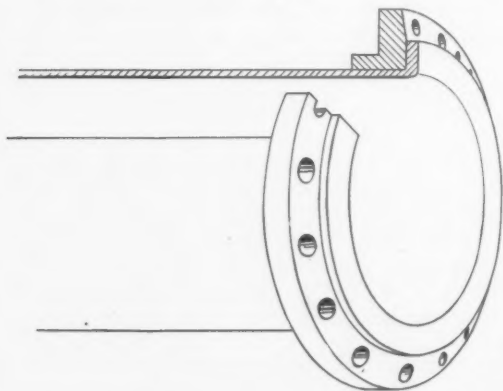


Fig. 1.—The Double Lap Flanged Pipe Made by the Whitlock Coil Pipe Company, Hartford, Conn.

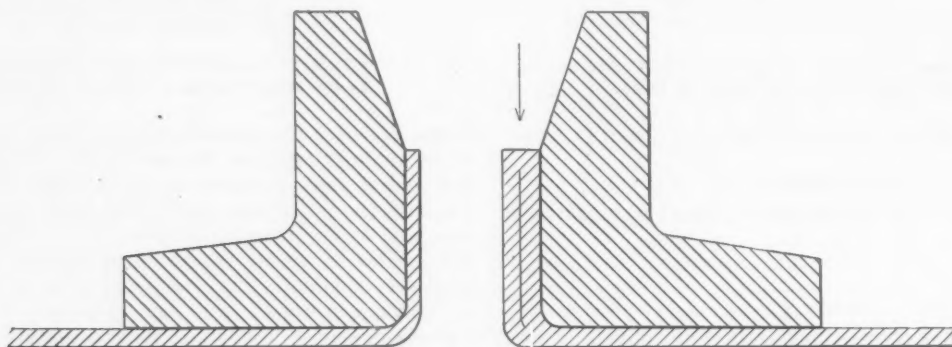


Fig. 2.—Diagram Showing the Difference Between the Ordinary Single Lap Pipe Flange and the Whitlock Double Lap Flange.

holes, as shown in Fig. 1, and is machined on both surfaces, the back being made parallel with the face.

Fig. 2 contrasts the usual, or single, lap joint with the double lap joint. It will be seen that after finishing, the root of the flange, as well as the flange itself, is thicker than the original pipe. This eliminates the tendency of pipe joints to become distorted after being under pressure for some time. For certain classes of service this joint makes it possible to use lighter pipe, no allowance having to be made in the thickness of the metal for its thinning at the joint in the process of flanging.

The Whitlock flanges are usually furnished in full weight steel pipe for working pressures up to 250 lb. per square inch.

The Litchfield Foundry & Machine Company, Litchfield, Ill., on April 2 purchased and took over the entire equipment of the Ætna Foundry & Machine Company, Springfield, Ill., including all drawings, patterns and templates, for the manufacture of the complete line of engines, sheaves, box car loaders, cage fans, and everything used in the manufacture of mine equipment. The company has also secured the records and specifications for all engines furnished by the Ætna Foundry & Machine Company and is prepared to duplicate orders or

furnish repair parts with promptness. This addition to its already complete line of mine equipment places a large variety of products at the disposal of purchasers, and those desiring Ætna machines will be assured of the same high grade work and material as is used in the Litchfield engine.

E. G. Acheson Receives Rumford Medals.

The American Academy of Arts and Sciences has conferred upon Edward Goodrich Acheson of Niagara Falls the Rumford medals. The presentation took place at a meeting of the society at the Algonquin Club, Boston, Mass., where the membership met on invitation of Prof. Elihu Thomson. It was a very notable gathering, made up of the heads of a score or more of the scientific departments of colleges, independent scientific investigators, distinguished legal lights and men of letters.

In an introductory address Prof. Charles R. Cross, chairman of the Rumford Committee, spoke of the twin trusts reposed by Count Rumford in the Royal Society of London and the American Academy, whereby awards were to be given for important discoveries in light and heat. It was his pleasure to observe that the award to Mr. Acheson was one distinctly in the line of the useful arts. The formal presentation of the medals was made by Prof. John Trowbridge, vice-president, and to his words Mr. Acheson made a feeling response. He told how, as a boy, he had heard of Rumford, and later of his provision for medal awards. His ambition to win the honor was fired. "To-night my dream has come true," he said, "and I value the medal as being the highest token of the appreciation of the scientific world." The medals are two in number, in gold and silver, struck from the same dies. On the obverse side are the words, "Benjamin, Count Rumford, Born 1765; Died 1814;" also an embossed portrait of Count Rumford. On the

reverse side is the inscription: "Rumford Medal for Discoveries in Light and Heat. Awarded by the American Academy of Arts and Sciences to Edward Goodrich Acheson for New Industrial Products of the Electric Furnace." These products are carborundum, siloxicon, artificial graphite and deflocculated graphite.

The American Rolling Mill Company, Middletown, Ohio, devotes an eight-page leaflet to its "American ingot iron" and the rust resisting sheets manufactured from such iron. The product was developed in the effort to furnish sheets with a maximum resistance to corrosion to meet the demands of the manufacturers of corrugated metal culverts. The above name was chosen by the company to distinguish its ingot iron sheets from steel, puddled iron or charcoal sheets, and it is added that the iron from which the sheets are rolled is made in ingot form and is guaranteed to have an iron analysis. Statements are given of the results of analyses, showing the comparative losses from corrosion of submerged sheets of American ingot iron, of steel and of charcoal iron in a saturated solution of salt water containing 2 per cent. sulphuric acid. The analysis of the ingot iron sheets is said to compare closely with that of Swedish charcoal iron.

An Australian Iron Pioneer.

William Sandford and the Industry He Established.

William Sandford was born in Devonshire, England, and went to Australia in 1883 as the representative of John Lysaght, Ltd., for which firm he erected and managed wire netting works on the Parramatta River, Sydney, New South Wales. In 1886 he leased the Mittagong Iron Works, at Mittagong, about 50 miles south of Sydney, which works had been in existence since 1848 and consisted of one blast furnace and a rolling mill. They had been idle since 1877. Mr. Sandford intended to re-work rails for the Government, but although the mill was remodeled, it was found after five or six months' operation that the project was not profitable, so he gave it up and went to Lithgow, some 60 miles west of Sydney, where, after seeing what a decided advantage this latter town had over Mittagong as an iron producing center, he leased the Eskbank Iron Works. These works were



WILLIAM SANDFORD.

started in December, 1875, and then consisted of a blast furnace, a small foundry, six puddling furnaces, one ball furnace and two mill furnaces and a steam hammer. The blast furnace had been dismantled just previous to Mr. Sandford's taking over the works. In fact, between the years 1882 and the early part of 1907 there was no pig iron whatever produced in Australia.

On taking over the Eskbank Works in 1886, Mr. Sandford commenced making merchant iron, the output at that time for the first three months being 157 tons. Some years after this he purchased outright the iron works, colliery and estate comprising at that time most of the land on which Lithgow now stands. Here on January 15, 1894, the first sheet mill ever erected in Australia was started. This plant consisted of a rolling mill, annealing furnaces and galvanized and corrugating departments. Steel was first made in Australia on April 24, 1900, when Mr. Sandford erected a small Siemens acid open hearth plant. The second sheet mill was erected about the middle of 1901, but was soon shut down on account of the duty on sheet iron being taken off. The difficulties in these works that have been experienced and overcome, chiefly through the alterations and uncertainties of the tariff, cannot be realized by one who has not gone through the experience.

On May 10, 1902, Mr. Sandford formed a company in London with a capital of \$3,650,000 to acquire his own works at Lithgow and erect two blast furnaces, steel furnaces and rail and plate mills. The project, however, came to nothing on account of the failure of the "iron bonus bill" to pass the Federal Parliament in Australia, and the refusal by the same Parliament to encourage the

establishment of the industry by placing duties on imported iron and steel. He nevertheless continued his operations at Lithgow and erected one small 14-in. mill and a guide mill, together with the necessary auxiliaries. In 1904 a steel foundry was erected for making steel castings. A large engineering shop was also established about this time for making switches and crossings for the Government railroads. This shop also contained punching, shearing, drilling, planing and plate bending machines for general engineering work.

During all this time Mr. Sandford had never lost sight of his ambition of being the first to erect a successful blast furnace in Australia, so that when at the end of 1904 the Government of New South Wales solicited bids for the supply of all iron and steel required by this State for a period of seven years, he saw at once that the time had come when, if he procured this contract, he would have sufficient security for his outlay to build a blast furnace. These bids were called for in every country in the world and yet, when the time limit expired on September 1, 1905, it was found that the only proposal submitted was that of W. Sandford, Ltd., as the firm was then called, for Mr. Sandford had made his works into a small limited company in 1902.

The contract was signed October 21, 1905. Almost immediately work was begun to get the plant ready. An up to date blast furnace was designed by Joseph Harrison of Middlesbrough, England, and P. G. Pennymore of Blaenavon, Wales, went to Australia to erect and work the furnace. Other extensions to the plant were a 15-ton Siemens open hearth basic steel furnace, a new rolling mill and new puddling furnaces. Many alterations were made in the plant.

The blast furnace was erected and is now in successful operation. It is a 17 x 75 ft. furnace. It has four (three erected) Cowper hot blast stoves, 22 x 74 ft.; four Babcock & Wilcox boilers with patent chambers to allow of the gas burning most efficiently, and two blowing engines. One of these engines is a steam turbine which will blow 30,000 cu. ft. of air per minute at a pressure of 15 lb. per square inch; the other is a vertical reciprocating engine held in reserve. The whole plant is lighted by electricity and everything of the most approved style has been used.

As a result of this contract, W. Sandford, Ltd., at the end of 1907, was supplying pig iron to every iron foundry in Australasia. The importation of foreign pig iron into Australia has almost ceased, and Mr. Sandford had realized his ambition of erecting and working a successful blast furnace, making a foundry iron equal to the best Scotch irons, and above all instilling into the minds of Australians that they not only have as good raw material as any country in the world, but also that they now have the basis of all industry and national defence—pig iron. He has always advocated the development of the iron and steel industry in the southern hemisphere, for he believes Australia should be able to do what Japan is doing, *i. e.*, build her own ships and provide all her own armament for defense. Thus, by erecting a successful blast furnace and making an excellent pig iron he has taken a decided step for the advancement of his country. When Mr. Sandford took over the Eskbank Iron Works he had 45 men working for him, at the end of 1907 there were over 1000 men in his employment.

Now comes the sad end to the story. When the contract was taken with the Government of New South Wales there was an overdraft on the plant of \$175,000. When the blast furnace and other alterations were completed, an overdraft of \$775,000 was the result—the estimated cost of the alterations having been far below the real figures. One of the reasons for this was unforeseen alterations in the tariff which made dutiable almost all the imported machinery for the plant. Consequently, when the firm needed a comparatively small working capital to carry it safely through the mire until a return could be made on the large outlay, the bank suddenly called for payment. After several unsuccessful attempts to get money, Mr. Sandford was forced to accept an offer from G. & C. Hoskins, large pipe founders in Sydney, to buy out the works, and this was done early in January, 1908. Therefore, Mr. Sandford has retired from taking

an active interest in the iron and steel industry of Australasia. He has attained his ambition and established this iron and steel industry without the help of either a duty or a bonus, which has never been done in any other

Milling Automobile Cylinders.

Two machines specially fitted for milling automobile engine cylinders, recently furnished a large automobile

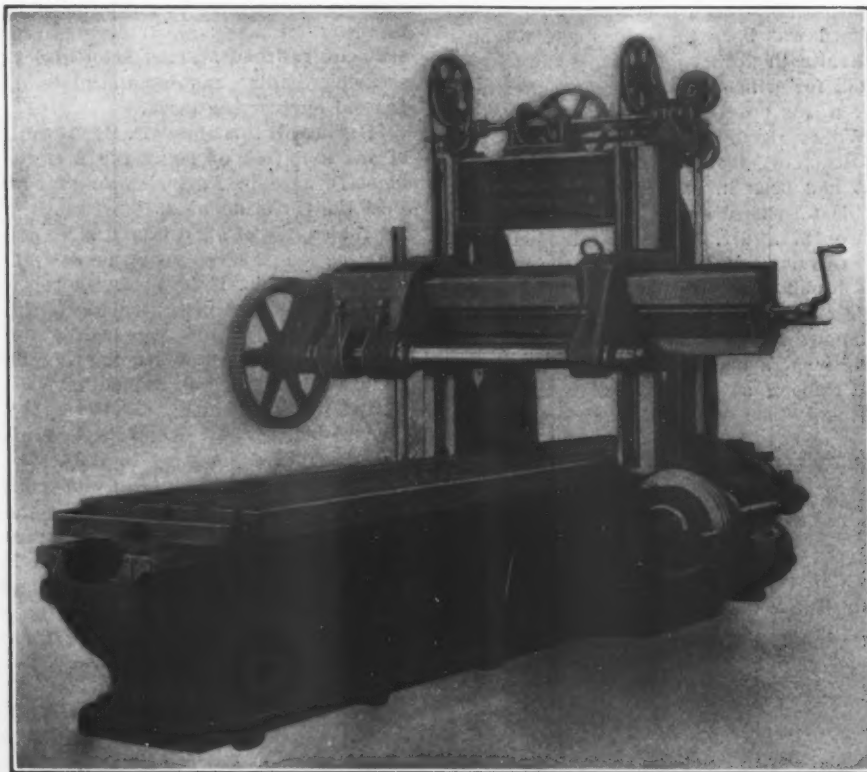


Fig. 1.—The 24 x 24 In. by 10 Ft. Horizontal Ingersoll Milling Machine Used for the First and Second Operations.

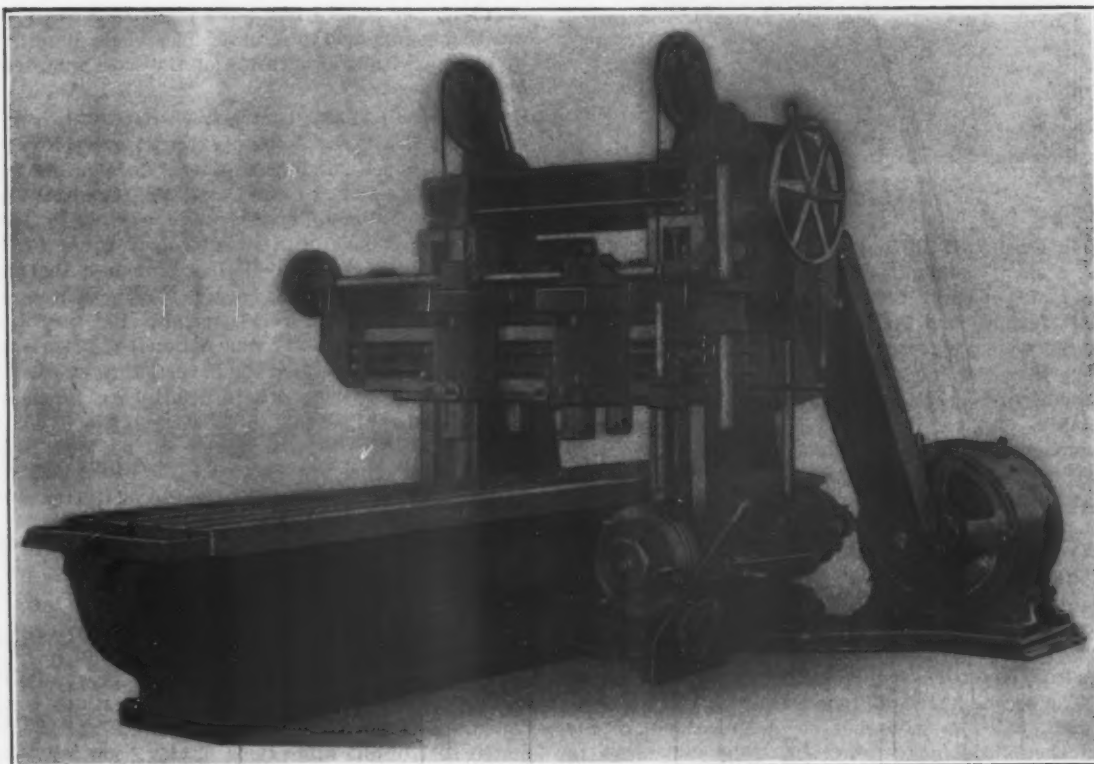


Fig. 2.—The Special Four-Head Ingersoll Milling Machine Which Performs the Finishing in the Third Operation.

country in the world. He is now on his thirteenth trip to England, resting on his laurels.

R. W. S.

In the two weeks between March 18 and April 1 the number of idle railroad cars in the United States and Canada increased from 297,042 to 306,507. The high point this year was reached on February 5 at 343,928, from which there was a gradual decrease up to March 18.

manufacturer by the Ingersoll Milling Machine Company, Rockford, Ill., are illustrated herewith.

The horizontal machine, Fig. 1, is one of the company's standard 24 x 24 in. x 10 ft. machines, and is used for milling the crank case cover seats, in performing what is indicated as the first operation in Fig. 4, and also for milling the tops of the cylinders, and at the same time the intake and exhaust connection seats, which is

shown as the second operation. Cutters *f* and *g* mill the tops of the cylinders, and *e* and *h* the intake and exhaust connection seats. A fixture is fitted to the table of the machine for holding a table load of these cylinders, two rows at one time. The second operation is a roughing operation only.

For finishing these cylinders a special four-head machine, front and rear views of which are given in Figs. 2 and 3, was furnished. This machine has two vertical spindles on the front of the rail for finishing the tops of the cylinders, while simultaneously two vertical spindles on the back of the rail finish the seats for the faces of the valve bushings. All of this work is done in one pass through this special machine—that is, the finishing

pertaining to the construction, equipment and decoration of buildings, as well as landscape and garden effects, this will be a radical departure from the usual form of exhibitions. It will be the first exhibition of its kind held in this country. It is announced that no space will be allotted to exhibits of ordinary character which possess no special features of novelty, utility, originality or beauty. Many of the foremost architects will aid and co-operate, and will exhibit in the Salon models, casts, drawings and photographs of unusual interest. The Salon will be a separate and distinct department of the exposition, occupying the huge elevated promenade platform 20 ft. wide surrounding the entire arena. On this platform there will be 40 studios of equal size, about 16

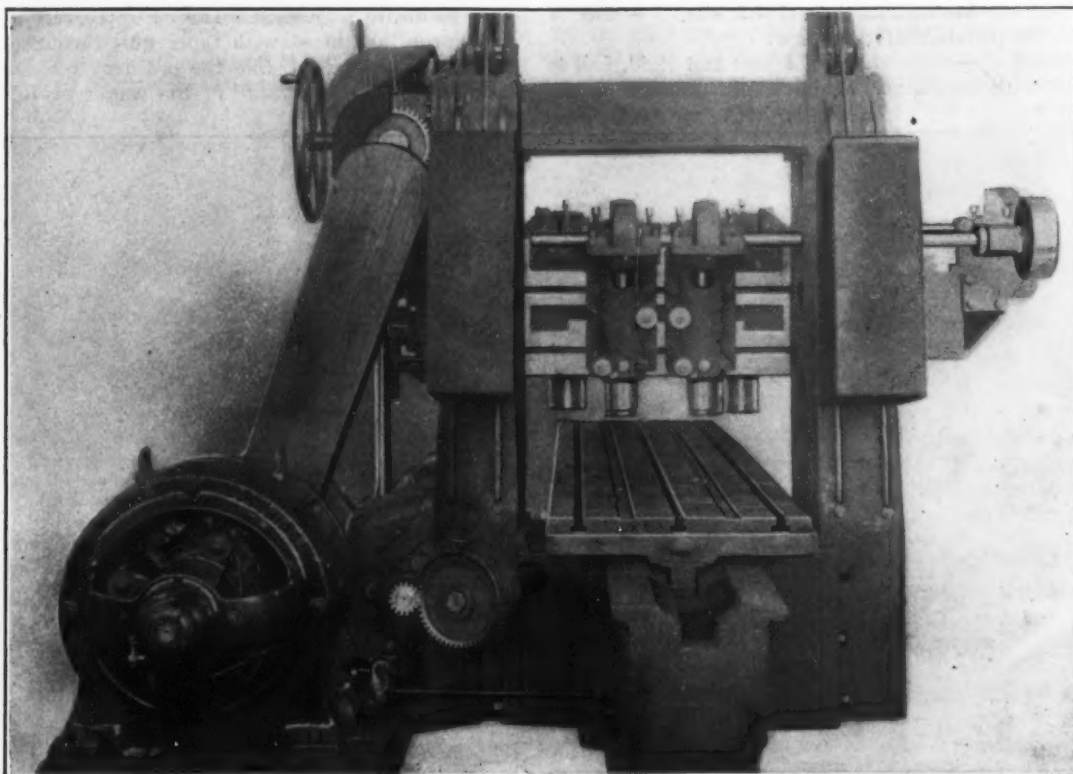


Fig. 3.—A Rear View of the Four-Head Machine, Showing the Spindles on the Back of the Rail and the Motor Drive.

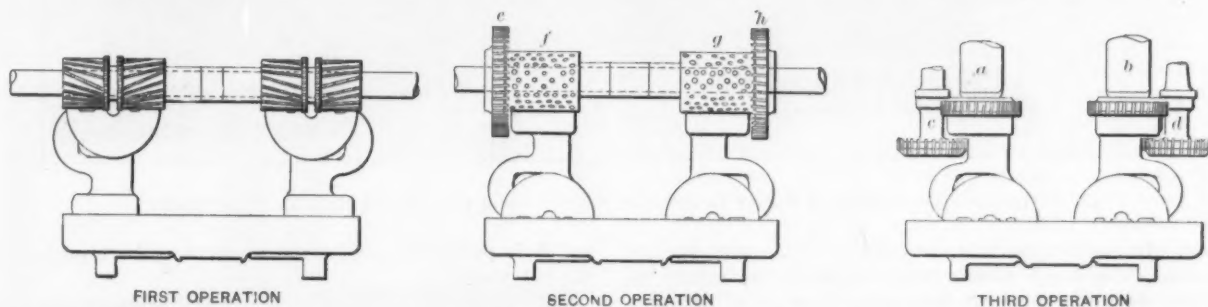


Fig. 4.—Diagram of the Three Operations.—Milling the Crank Case Cover Seats; Milling the Tops of the Cylinders and the Intake and Exhaust Connection Seats, and Finishing the Tops of the Cylinders and the Seats for the Faces of the Valve Bushings.

cuts are taken as shown by the third operation in Fig. 4, where *a* and *b* represent the spindles on the front of the rail and *c* and *d* those on the rear.

Both of these machines are motor driven. A 10-hp. variable speed motor drives the horizontal machine and a 15-hp. variable speed motor the four-head machine. The rear view of the latter, Fig. 3, shows the arrangement of the motor drive. The cross rail on each of these machines is counterbalanced.

An Architectural Exposition.—The first annual National Architectural Exposition will be held during the week of September 14 to 19 at Madison Square Garden, New York City. By the combination and co-operation of all departments in architecture, engineering, painting, sculpture, the trades, manufacturing and craftsmanship

x 7 ft., affording three walls in each studio for hanging and ample room in the center of each studio for models. Application blanks and floor space diagrams can be had from Alfred Chasseaud, general manager, 1 Madison avenue, New York City.

The Cleveland Cap Screw Company, Cleveland, Ohio, has changed its name to the Electric Welding Company. It manufactures vise screws, gas engine valves, cam shafts, spindles, cap screws, &c., under the resistance electric welding process, for which McCoy & Brandt, 619 Ferguson Building, Pittsburgh, are agents.

The steel car plant of the Pressed Steel Car Company, at New Castle, Pa., has closed down temporarily for lack of orders.

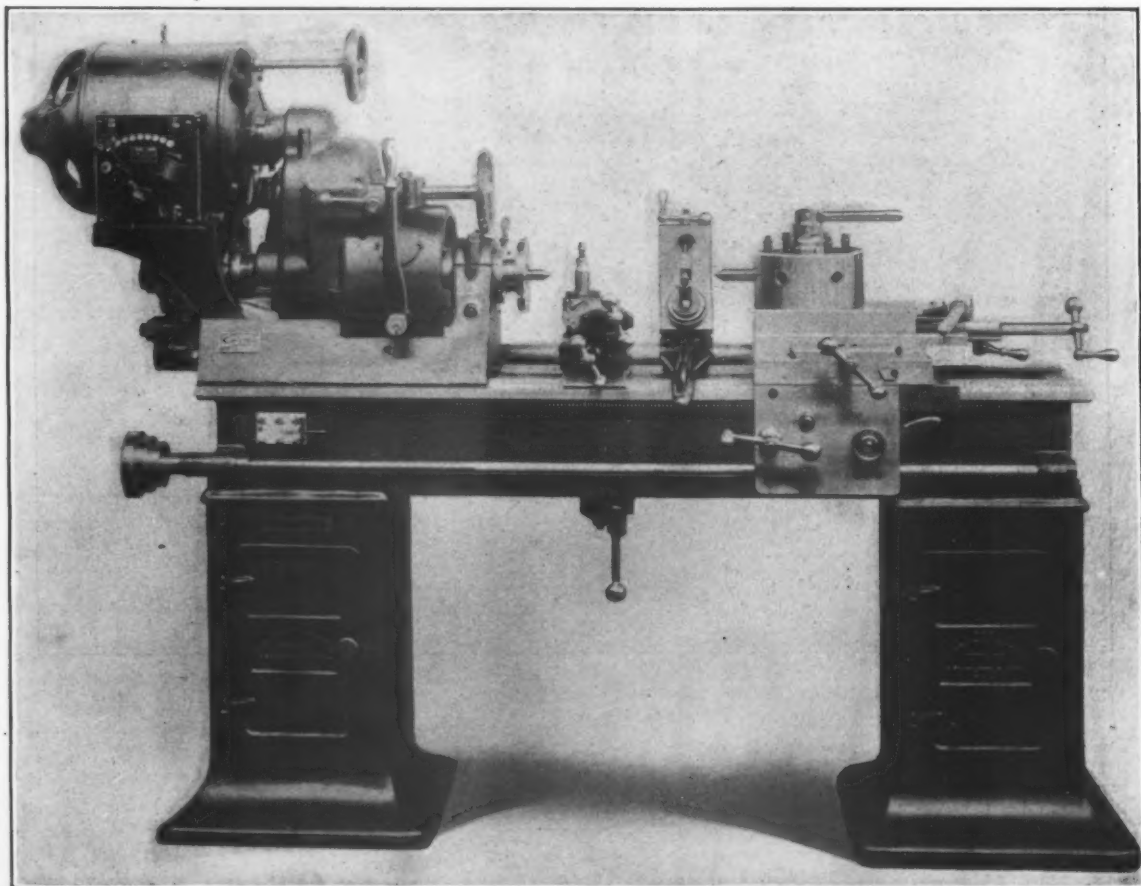
A Springfield Motor-Driven Lathe.

The engraving herewith shows the latest motor drive which the Springfield Machine Tool Company, Springfield, Ohio, has applied to its brass working turret lathes. It employs a Lincoln variable speed motor, connected to an all geared head lathe. The motor is arranged for a variation of 6 to 1, and is controlled by the handle shown at the top of the motor. By turning this handle the armature of the motor is drawn either into a stronger or weaker field, thus increasing or diminishing the speed of the machine.* The starting box is placed within convenient reach of the operator, and is automatic in its release, when the power is turned off. The double throw switch on the bed of the machine provides a simple means of reversing the rotation of the motor.

The head of the machine is compact and rigid, and is arranged with an all geared drive for transmitting the

handle to its first position the turret is still further clamped to the carriage. This insures perfect alignment and absolute rigidity. The handle at the rear of the machine engages the screw feed to the turret, when delicate feeds are necessary. When more rapid movement is desired the handle at the front of the turret carriage may be used by unlocking the sleeve in which the screw operates.

The turret is furnished with a taper attachment, the taper bar of which is contained in the center of the bed, and is adjustable so that a taper of 4 in. to the foot can be obtained. The slide on the taper attachment bar is gibbed to take up wear. When the taper attachment is not in use the cross slide is held to the carriage in central position by a taper pin at the rear of the cross slide to insure alignment. The entire turret, cross slide and apron, are fitted with taper gibbs throughout. The turret has cross feed, like the ordinary compound rest, and can be run either side of the center or to a stop,



An 18 In. by 6 Ft. Springfield Turret Lathe with Friction Head and Lincoln Variable Speed Motor.

power from the motor to the spindle. All gears are inclosed. The head affords four mechanical changes of speed; two are obtained through sliding gears manipulated by the handle directly back of the friction handle and are doubled by the back gears. The lower hand wheel, the one on the headstock, is used to revolve the spindle by hand, as when bringing the tool to the end of a square thread ending in a drilled hole, or similar operations. The large handle seen in the vertical position is the lever operating the friction head. All the journals in the head are self-oiling, and contain large reservoirs, which need only infrequent filling.

The carriage and turret arrangement of the machine is very complete. The turret, which is large and heavy, has bushed holes, and is indexed by the handle shown above it. The indexing mechanism is unique and substantial. By the backward movement of the handle the locking pin is withdrawn from the turret base and held there while a forward movement of the handle brings the next turret tool in position, when the locking pin enters and securely locks the turret. By returning the

which is provided so that the turret may be brought to central position.

The apron is provided with power feed of three variations. The feed is engaged by the friction handle at the front of the apron and may be reversed by the lever at the side of the apron. When the power feed is not in use and other movements are desired the carriage is clamped to the bed by a rigid clamping device at the right of apron.

The chasing bar is arranged in the usual manner, and can be thrown out of the way when not in use. Its tool post is provided with a down feed and is adjustable so that the tool may be placed either ahead or back of center. The chaser bar is of heavy construction, and is supported by brackets. Taper threads may be chased with the tool by tilting the slide in which the forward part of the chasing bar rests when in position. The different pitches of thread are obtained by the usual follower and leader device, and either right or left hand threads can be chased without changing any gears. A handle on the rear of the head throws in a tumbler gear, which reverses the direction of rotation of the leader. This feature is valuable and avoids the need of a large

* For description of the Lincoln variable speed motor see *The Iron Age*, March 1, 1906.

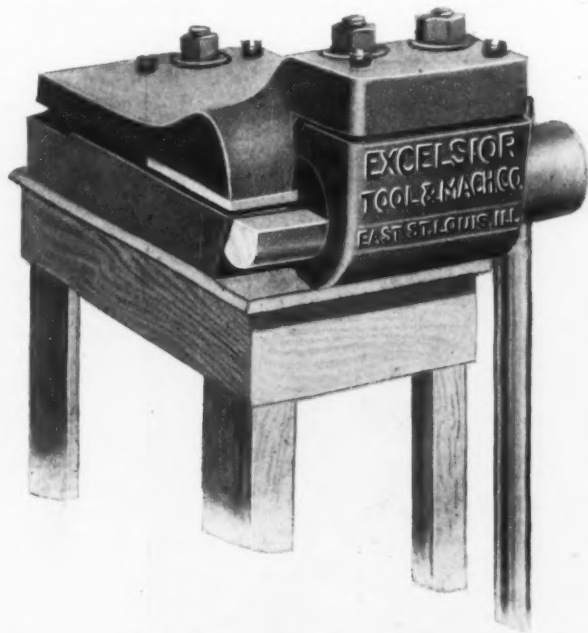
number of leaders for the various right and left hand threads to be chased. The follower is kept in contact with the leader by a heavy spring, which insures uniform lead to the thread being cut.

The compound rest is unique and can be operated in nearly every position. It is made interchangeable with the hand rest, and has considerable movement in any direction. The compound rest is graduated in degrees, and, after swiveling to position, may be securely clamped by a small screw at the front.

This machine is also built regularly in the four-step cone type, with friction head, as well as the five-step cone, without friction head.

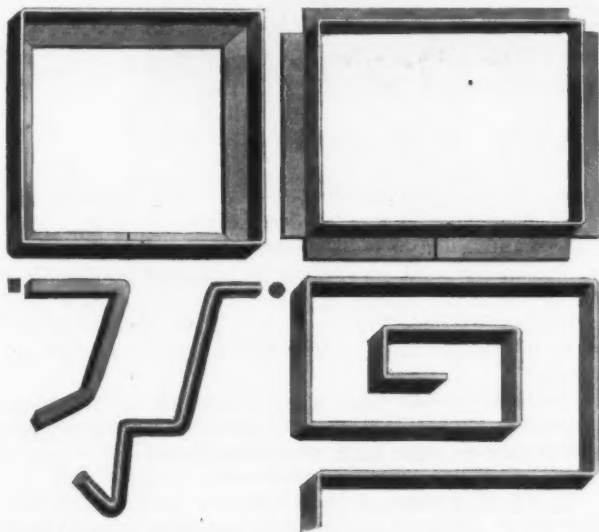
The Excelsior Band and Angle Iron Brake.

An original design of open end brake for bending band and angle iron and bars, built by the Excelsior Tool &



The No. 13 Band and Angle Iron Brake Made by the Excelsior Tool & Machine Company, East St. Louis, Ill.

Machine Company, East St. Louis, Ill., and samples of the work that can be formed on this machine, are shown in the illustrations herewith. It will handle up to $\frac{1}{4} \times 1\frac{1}{2}$



Examples of Work Which Can Be Formed on the Excelsior Band and Angle Iron Brake.

in. band or angle iron and up to $\frac{1}{2}$ -in. square or round bars. It is a very useful tool for iron workers and is extensively used in range and cornice shops, saving much time and the use of the larger machines which must otherwise be applied to this kind of work. The top of the machine is adjustable for work of different thicknesses,

from 1-16 to $\frac{1}{2}$ in., and is constructed so that the material can be inserted and removed from the side, which is very desirable, especially when long bars are used. The work can be set to adjustable gauges or stops when duplicate bends are to be made. The lever handle at the right is adjustable and can be set to bend a variety of angles. The lower or removable jaw and the face of the upper jaw are made of hardened steel. The machine weighs 40 lb. and its design, material and workmanship are claimed to be such as to make it very rigid and durable.

Tin Deposits at Spokane, Wash.

WASHINGTON, D. C., April 20, 1908.—A bulletin is about to be published by the United States Geological Survey giving a description of a body of tin ore at Silver Hill, near Spokane, Wash., which has been examined for the survey by Arthur J. Collier. The tin bearing mineral, cassiterite, was identified as such in the summer of 1906. The deposits are situated on an interurban railroad within half an hour's ride from the center of the city. Tin ore has been found at four localities in this area.

The ore body in the principal workings was first developed by an open cut 150 ft. long, in which a mass of pegmatite and quartz was uncovered. The tin bearing rock dips to the southwest at an angle of about 45 degrees and lies between well defined walls. The maximum thickness of ore found at any point was probably not less than 10 ft. From the point where the richest ore was found a shaft has been sunk to a depth of 125 ft. on an incline of approximately 45 degrees. Some cassiterite was found to a depth of 50 ft., although it gradually decreases in amount below the bottom of the cut. Below the 100-ft. level the walls of the ore body come together, and for some distance the vein or dike is not well defined, although large nodules of tungsten ore have been found. On the 100-ft. level drift is partly in barren quartz and partly in the pink pegmatite regarded as tin bearing rock. About 35 ft. from the shaft this rock contained a notable amount of cassiterite, and part of it was rich enough to be regarded as tin ore. The excavations have gone far enough to show that the tin bearing intrusion is of irregular form; that the tin is not uniformly distributed through it, and that it may be confined to an ore shoot pitching to the northwest.

In the course of these excavations the tin ore has been carefully selected from the barren rock and piled on the dump, where, at the present time, there is probably from 100 to 200 tons. It consists of pieces varying in size up to 100 lb. or more, in which the cassiterite is unevenly distributed in grains from the size of a pin head to several pounds in weight. From an inspection of the dump Mr. Collier is of the opinion that the cassiterite or black tin contained is about 6 per cent. The cassiterite is reported to be remarkably free from impurities.

Veins and dikes of pegmatite are not uncommon elsewhere in the metamorphic rocks of this region, which are continuously exposed for several miles to the east and outcrop at intervals for at least 40 miles to the south. No cassiterite has yet been found in these rocks except at Silver Hill, but such discoveries are to be expected.

The developments at Silver Hill indicate that the tin ore is to be found in detached masses whose relations to each other cannot yet be forecast, and the economic value of the deposit will depend to a considerable extent on the amount of excavation necessary to locate other ore bodies. This can be determined only by experience involving a further outlay of capital and possibly requiring several years' time, but the discoveries already made are of sufficient value to warrant such investigations.

W. L. C.

The Standard Metal Mfg. Company, 43 Canal street, Chicago, has taken over the Acme Bearing Journal Company, and will remove about May 1 to 8 and 10 Canal street. Besides the S. T. B. composition bearings, which formerly comprised the sole product of the company, it is now prepared to manufacture and furnish all kinds of brass and other metal bearings for cars, trucks, &c.

The Pels One-Stroke Beam Shear.

The one-stroke gear driven beam shear known as the type R T T, shown in the accompanying engraving, is an addition to the line of steel plate frame punching and shearing machinery built by Henry Pels & Co., 68 Broad street, New York City. It is built in five sizes, with capacities from 3 in., 5½ lb., to 24 in., 100 lb., I-beams, and all sections of channels, angles, tees, &c. With this new tool a section may be sheared in one setting—i. e., after inserting the material in the throat of the machine no further handling is required. This is radically different from the old practice, in which half of a section was sheared and then the piece turned over to complete the cut.

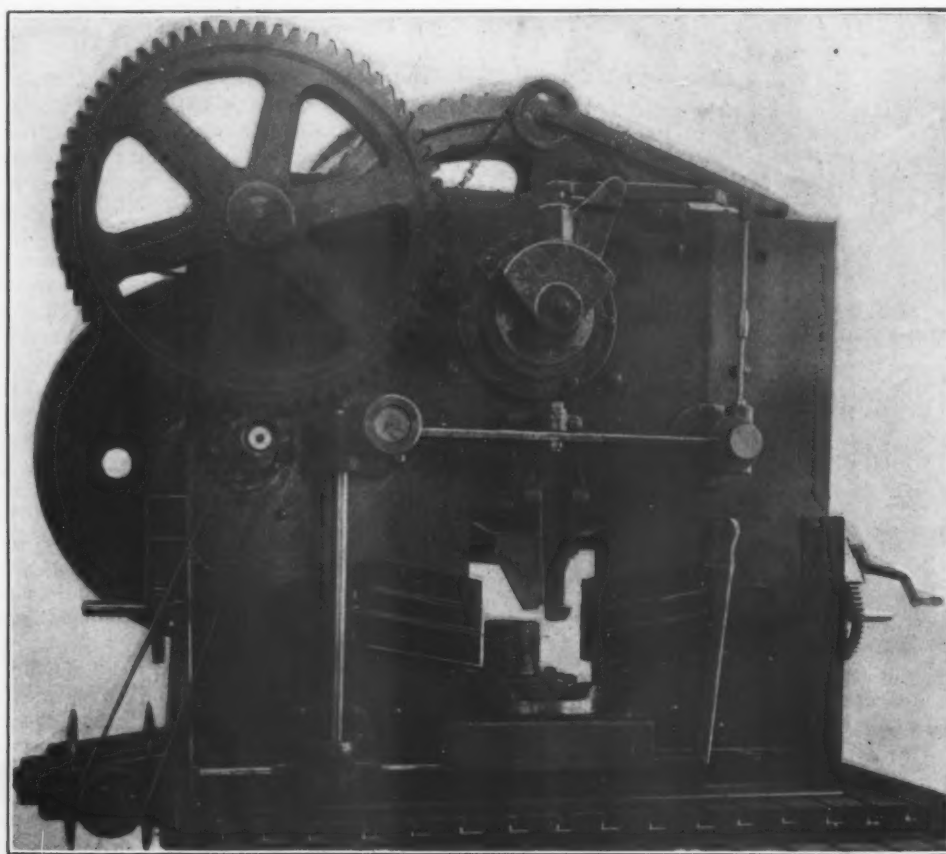
The method of operation is simple and is as follows: The beam is placed in the throat, and the side knives are screwed against the flanges, thus clamping the material in place. The upper knife holder is the shape of an inverted triangle, of which the knife is the lower

rolled steel plates, the gears are of semisteel of heavy design, and the various shafts, connecting rods, &c., are open hearth steel forgings.

The Coal Mines Conference Agrees on Old Terms.

At the joint conference held in Toledo April 17, the miners and operators of the central competitive field completed their labors by adopting the report of the Scale Committee unanimously. The report provided for a resumption of mining April 20; that the rate for mining in vogue up to April 1, 1907, be reaffirmed; that the various districts settle internal differences, and that all screens shall be not less than 5½-in. surface. The block coal district may continue the use of the diamond screen of present size, with the privilege of run of mine coal. A week's work is to consist of 48 hr. This shall be exclusive of the time required to reach the working places.

The men are to be paid for 2 hr. when they enter the mines, even if the mine does not work 2 hr. There-



The New One-Stroke, Gear-Driven, Type RTT Beam Shear Built by Henry Pels & Co., New York.

apex. At each of its upper corners the knife has bearings through which sliding bolts are alternately inserted automatically to control the movement of the knife. When the machine is thrown in action the left-hand bolt is in position and the right-hand bolt withdrawn. The rotation of the eccentric on the shaft then causes the upper knife to swing through a quarter circle to the left, on the left-hand bolt as a center, thus shearing the left half of the section. On the return movement the left-hand bolt is withdrawn and the one on the right inserted, and the next revolution of the eccentric causes the upper knife to move in a corresponding quarter circle to the right, completing the cutting operation, which requires less than 20 sec. on the heaviest section. The lower knife holder revolves on its center and automatically follows the movement of the upper knife and adjusts itself to all sections. In shearing plain angles, bulb angles, tees, &c., the upper knife works only to the left and the lower and side knives are stationary.

All parts are easily accessible and the shear may be worked by unskilled labor. As in all other types manufactured by this firm, the flywheel is the only cast iron used in the construction. The frame is formed of heavy

after they are to be paid by the hour. This refers to the laborers. The contract expires March 31, 1910. The present agreement is to be referred to a referendum vote of the miners. A resolution is attached condemning speedy action by miners or operators resulting in a premature strike, and that the present joint convention adjourn to meet on the first Tuesday in February, 1910, in Toledo.

The Illinois coal fields are not included in the above agreement. The operators and miners in that State are endeavoring to settle their own differences.

The F. C. Richmond Machinery Company, Salt Lake City, Utah, has been organized to handle a general line of machinery, but making a specialty of mining machinery. The new company is incorporated with a capital stock of \$100,000. F. C. Richmond, president of the company, was for many years general manager of the mining machinery department of the Salt Lake Hardware Company. The company has secured the sales agency of a number of important lines of machinery, chief among which are the Chicago Pneumatic Tool Company and the Almo Mfg. Company.

The Improved Ajax Bulldozer.

To give better control of the machine and increase facility of operation the Ajax Mfg. Company, Cleveland, Ohio, has redesigned its bulldozers and is now building larger sizes equipped with double friction clutches. The new machines provide a variable stroke of the cross head and such perfect control that it may be reversed at any point in its stroke. An additional advantage claimed for these double friction clutches is that they economize time by giving only a partial back travel of the cross head, from which point it can be started forward to make shallow bends or to punch or shear plates. When setting dies the double friction clutch is useful, as it permits the operator to bring the cross head forward by degrees or stages, and thus determine and effect the proper setting of the dies.

In the smaller sizes of bulldozers, No. 3 to No. 6 inclusive, the Ajax Mfg. Company is still using the single friction clutch and a band brake, since the double friction clutches are not regarded as so important on these smaller sizes. The larger sizes, No. 7 to No. 12 inclusive, have the double friction clutches, but if preferred they can be furnished with the single friction clutches and the band brake, like the smaller sizes.

Another important change in the redesigned Ajax bulldozer is the substitution of direct gearing for the former worm and worm gear drive. Cut gears are now used throughout. The precise meshing of the gears reduces the power necessary to operate the machine and also increases the uniformity of duplicate bending work. Two other changes have been made which, it is claimed, materially improve the Ajax bulldozer. One of these is the fixing of two long steel adjusting gibs to the cross head, by which the cross head is maintained in perfect alignment and adjustment. The other is the furnishing of a loose filler piece, T-slotted and fitted in between the seats of the die space to facilitate the handling of the dies.

The demand for the largest bulldozers is confined principally to the large car building and car repair shops.

30 in.; die space when cross head is forward, 72 in.; ratio of gearing, 80 to 1.

The machine is driven by a 40-hp. motor, which is directly geared to the shaft carrying the two friction clutches, which are controlled by the cross handle lever shown in the center of the machine. This arrangement is convenient and accessible to the operator in starting the cross head forward and in stopping and reversing it. All the gears and pinions are cut from solid blanks. The bed plate is cast with two heavy ribs, not shown in the illustrations, running below the floor line, thus giving enormous strength and rigidity to the machine.

The Rust Boiler Company.—The engineering department of this company now occupies part of the fifth floor

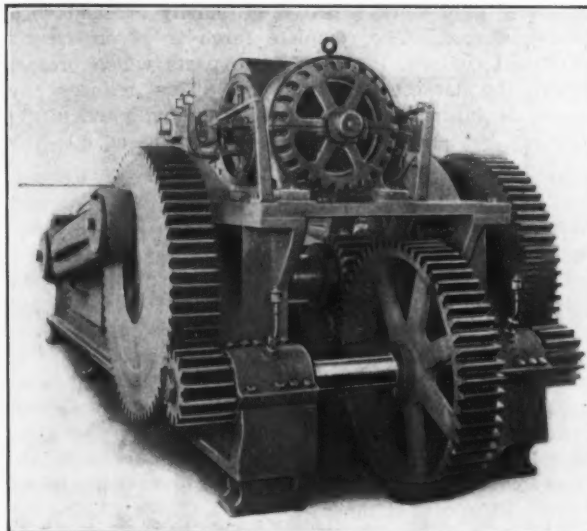


Fig. 2.—Rear View of the No. 12 Ajax Bulldozer, Showing the Driving Motor.

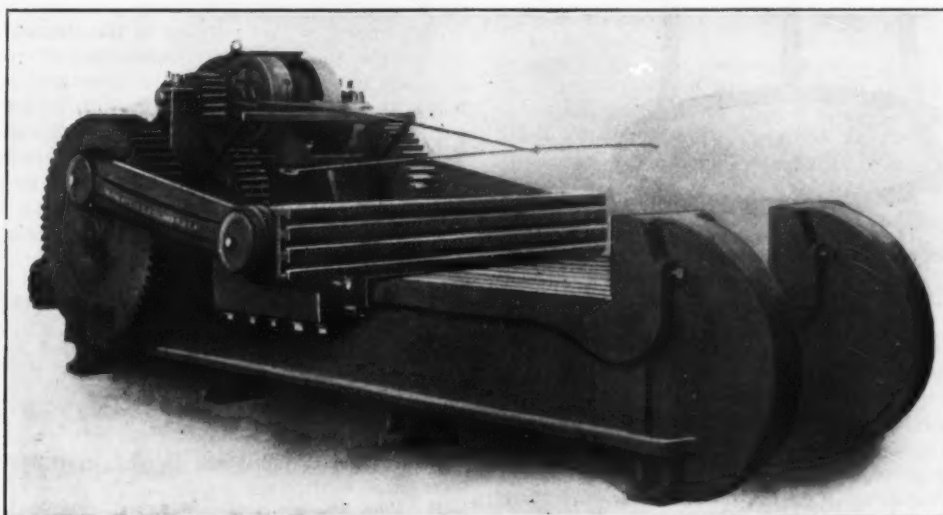


Fig. 1.—The No. 12 Bulldozer Built by the Ajax Mfg. Company, Cleveland, Ohio.

The Ajax Mfg. Company has recently built and installed in the shops of the Pennsylvania Railroad at Altoona, Pa., one of its No. 12 machines. This is the largest bulldozer ever made by the Ajax Company, and is said to be the largest one ever built. The accompanying illustrations are of this machine, one showing the working side and the other a rear view in which the motor and driving gears can be seen. With the exception of the dimensions this machine is similar to the smaller Ajax bulldozers, which are equipped with the double friction clutches.

The approximate weight of the No. 12 bulldozer is 140,000 lb.; the bed casting alone weighs 86,500 lb. The principal dimensions are as follows: Floor space, 23 x 10 ft.; face of cross head, 16 x 108 in.; travel of cross head,

of the German National Bank Building, Pittsburgh, Pa., while the general offices are on part of the sixth floor, but on and after May 1 they will be consolidated and will occupy the entire fifth floor of the building. The company reports business moderately active, while inquiries are more numerous. Orders booked within the last month on which early deliveries are to be made are as follows: Pulaski Iron Company, Pulaski, Va., 311 hp.; Ohio & Texas Sugar Company, Brownsville, Texas, 1016 hp.; Wellston Iron & Steel Company, Wellston, Ohio, 608 hp.; Cummer Lumber Company, Jacksonville, Fla., second order, 706 hp.; Westmoreland Coal Company, Irwin, Pa., 608 hp.; Temple Iron Company, Temple, Pa., 506 hp.; Marshalsea Poor Farm, Marshalsea, Pa., 1020 hp.; North American Lead Company, Fredericktown, Mo., 592 hp.

A Buffalo Compressed Air Forge.

In line with the trend toward compactness, simplicity and high efficiency in machinery and mechanical appliances in general is the compressed air forge recently developed by the Buffalo Forge Company, Buffalo, N. Y. This, the No. 22-C forge herewith shown, is constructed principally of sheet steel and angle irons which makes it simple, neat, strong and durable.

More in detail the forge consists of a sheet iron bowl 18 in. in diameter and 6 in. deep, mounted on three angle iron legs and equipped with a removable sheet steel dash. The height from the floor line to the top of the fire pan is 32 in., and the total weight 35 lb. These figures indicate that the forge is not intended for extremely heavy forge shop work, but is suitable for heating rivets, small tools and doing light work which is ordinarily handled with portable forges. The complete forge is of practically cylindrical contour, there being no parts which project beyond the largest circumference. This reduces the chance of injuring it by rough handling, particularly since all but one or two parts are made of steel or



The No. 22-C Compressed Air Forge Made by the Buffalo Forge Company, Buffalo, N. Y.

wrought iron. The tuyere is of cast iron, but is in a protected position. The injector shaped nozzle is also cast iron, but being located underneath the forge is shielded by the legs and the bracing. The compressed air connection is just underneath the bowl and does not project beyond it. The three angle iron legs slope outward, and instead of resting directly on the floor, giving only three points of contact, are riveted to a circular ring of 1 x 1/4 in. bar iron 42 3/4 in. in diameter. At 14 in. above the floor line the legs are braced by a triangular band of iron riveted to each leg.

The compressed air which furnishes the blast is introduced through a double nozzle or injector. The smaller nozzle is of brass and is fitted with a needle valve to regulate the amount of compressed air supplied. This valve is fixed in adjustment by a lock nut on the valve stem, and further regulation is obtained by a valve in the air connection just underneath the bowl of the forge. In operation a small amount of compressed air issuing from the needle valve at high velocity through the nozzle shaped opening above it creates a vacuum which draws in surrounding air. The combined jet repeats this action through the final nozzle, drawing in more free air, so that about 60 times the volume of free air escaping from the first nozzle is supplied to the fire in the forge. The equivalent of 0.3 cu. ft. of air at at-

mospheric pressure suffices to deliver 20 cu. ft. at the tuyere, showing a marked economy compared with a direct blast or a combination of compressed air and fan blast.

Molybdenum Ore.

Some molybdenum ores found in Maine, Utah and California are described by Frank L. Hess, one of the geologists of the United States Geological Survey, in an advance chapter from Bulletin No. 340, which forms Part 1 of "Contributions to Economic Geology, 1907."

The Maine ore is molybdenite and is widely distributed. The principal deposits are in Washington and Hancock counties, and these have been brought into more or less prominence through the several companies that have been formed to exploit them. The California ore described is also molybdenite and was discovered during 1906 in a granite quarry about 4 1/2 miles northeast of Corona, Riverside County. The granite is cut by pegmatite dikes 1/2 to 2 in. wide, and molybdenite in flakes up to 1/2 in. across accompanies the dikes in small quantities. The Utah deposit is wulfenite (lead molybdate) and occurs at Alta, one of the older mining camps of the State. Its presence has been known for years, but the ore has always been sold for its lead content, as aside from this it had merely a mineralogical interest. It is only within recent years that wulfenite has acquired importance as a source of molybdenum.

Most molybdenite deposits are too small to justify the erection of expensive machinery, and the present market would probably be unable to handle any great increase in output; but, on the other hand, if a constant supply was available at prices within reach of manufacturers, it is probable that the demand would increase considerably, for uncertainty in obtaining a regular supply of ore seems to have been one factor in preventing the extensive use of molybdenum in steel, in which it is said to have much the same effect as tungsten, even when employed in much smaller quantity.

Molybdenum in the form of ammonium molybdate is used to determine phosphorus in iron, several tons a year being applied to this purpose in the United States alone. In Europe ammonium molybdate is employed as a fire-proofing material and it is said to be a strong germicide, being used as a disinfectant for cloth in railroad passenger coaches and for other similar purposes. The lead molybdate, wulfenite, is more easily saved than molybdenite, but it is produced in only a few localities and in very small quantities, and it often carries so many impurities that it is almost impossible to use it.

Steel Production in Germany.

According to the statistics compiled by the Verein deutscher Eisen und Stahl Industrieller, 102 works in Germany and Luxemburg produced the following quantities of steel in 1907, in metric tons:

	Acid. Tons.	Basic. Tons.	Total. Tons.
I. Ingots:			
(a) Converter	387,120	7,212,454	7,599,574
(b) Open hearth.....	212,620	4,039,940	4,252,560
II. Steel castings.....	85,421	126,077	211,498
Totals, 1907.....	685,161	11,378,471	12,063,632
1906.....	715,952	10,591,855	11,307,807
1905.....	655,495	9,411,058	10,066,553
1904.....	610,697	8,319,594	8,930,291
1903.....	613,399	8,188,116	8,801,515
1902.....	517,996	7,262,686	7,780,682
1901.....	465,040	5,929,182	6,394,222
1900.....	422,452	6,223,417	6,645,869

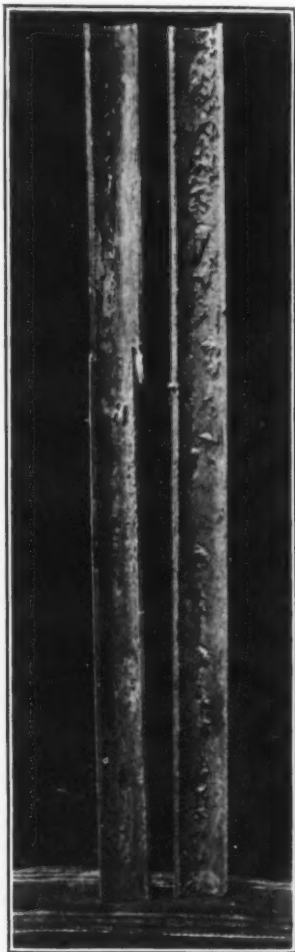
In 1907 six works made acid Bessemer and 22 works basic Bessemer steel, while 16 works produced acid open hearth and 64 works basic open hearth steel. Acid steel castings were made in 38 establishments and basic steel castings in 36 works.

The total number of immigrants to the United States in March was 32,517, as compared with 139,118 in March, 1907, a decrease of 76 per cent. From March, 1906, the decrease was 77 per cent.

Aluminum Condenser Tubes.

In many localities the life of the tubes of a surface condenser is quite brief, as they are rapidly corroded by the cooling water. Along the Monongahela River, in the Pittsburgh District, for example, surface condenser tubes of brass or copper are sharply attacked by the sulphuric acid and sulphates resulting from the coal mining operations carried on in the valleys of the river and its tributaries. The trouble from this cause is so great that surface condensers are usually avoided there, jet condensers being used in spite of the fact that with surface condensers the water of condensation could be returned to the boilers, thus avoiding the necessity of feeding the boilers with river water, which of course is decidedly detrimental to the boilers.

One large manufacturing establishment has been compelled to abandon the use of brass tubes entirely and resort to pure copper tubes, which are found to have a greater life than the brass tubes, the increase in durability being sufficiently great to justify the use of the more expensive tubes. Even with pure copper tubes, however, the life is brief. The accompanying illustration, reproduced from a photograph, shows the condition of these copper tubes after they have been in service some time, and plainly indicates the injurious effect of the cooling water upon them.



Corrosive Effect of Monongahela Water on Copper Condenser Tubes.

About a year ago one of the condensers at this plant was fitted with an installation of tubes which promises to overcome this difficulty. These tubes consist of a copper tube drawn down on an aluminum tube, so that the cooling water does not come in contact with the copper. Aluminum resists the corrosion of sulphuric acid and sulphates better than any of the other common metals and for this reason gives longer service. Commercial aluminum, however, contains minute quantities of iron and copper as impurities, and these impurities are occasionally segregated in spots. On making an experiment with pure aluminum tubes, it was found that the cooling water attacked these impure spots, perforating the tube and rendering it useless. A bi-metallic tube was then constructed, as above described. The aluminum interior of this tube being very resistant to the cooling water, the corrosion in it is slow. When the cooling water finally perforates the aluminum interior (for the reason above described), it is prevented from attacking the copper by reason of the fact that the aluminum, being the electro-positive member of the galvanic couple formed by the two metals protects the copper from corrosion, just as galvanizing protects iron. No corrosion of the copper will then take place until the aluminum has been entirely carried away for a considerable distance around the perforation, thus leaving a perfect copper envelope for a much longer time than is the case when copper is

used alone. This installation of tubes was made about a year ago, and not a single tube has yet failed.

These tubes are made in all the standard sizes used in condensers, and possess the advantage that, on account of the high heat conductivity of aluminum and copper, they are superior to brass in heat conducting properties. At the same time they cost approximately the same amount as brass condenser tubes, thus combining long life with low first cost. In most situations where condenser tubes fail through corrosion by the cooling water, tubes of this character will considerably reduce the operating cost of the power plant using surface condensers. These tubes are manufactured by the Aluminum Company of America, Pittsburgh, Pa.

The Lake Superior Iron & Chemical Company.

The authorized mortgage indebtedness of the Lake Superior Iron & Chemical Company, Detroit, Mich., is now \$1,700,000. The mortgage for \$6,000,000 given by the company under date of May 1, 1907, has been discharged and the bonds secured thereby have all been canceled. Only \$2,675,000 of these bonds were ever issued, and these have been exchanged for an equal amount of 7 per cent. preferred stock. The stock now consists of 7 per cent. cumulative preferred stock, \$2,675,000, and common stock, \$5,350,000; total authorized share capital, \$8,025,000. The \$1,700,000 of new bonds are intended for collateral purposes only, and will not be sold. They consist of \$1,250,000 authorized, covering manufacturing plants and connected real estate, of which amount \$1,013,000 has been issued, and \$450,000, all issued, covering certain timber lands in Alger, Delta and Schoolcraft counties. The stockholders of the following companies received preferred and common stock in the Lake Superior Iron & Chemical Company in exchange for their holdings, the late Joseph H. Berry of Detroit, having a large interest in most of them:

Ashland Iron & Steel Company, Ashland, Wis.
Manistique Iron Company, Manistique, Mich.
Michigan Iron Company, Newberry, Mich.
Northern Charcoal Iron Company, Chocoma, Mich.
Boyne City Iron Company, Boyne City, Mich.
Furnace and chemical plants of Elk Rapids (Mich.) Iron & Chemical Company.
Burrell Chemical Company, Manistique, Mich.
Superior Chemical Company, Newberry, Mich.

The Lake Superior Iron & Chemical Company has six blast furnaces using charcoal as fuel, iron mines at Bessemer, Mich., and Tyler Forks, Wis., and a large acreage of hardwood timber. Its total pig iron capacity is 205,000 tons a year. The officers are the following: Elisha H. Flinn, president; W. G. Sharp, vice-president; W. G. Smith, treasurer; John Christian, secretary; W. H. Hinkle, chairman Executive Committee.

The Morgan Engineering Company, Alliance, Ohio, has received an order from the Indiana Steel Company, Gary, Ind., for a 24-in. continuous billet mill, complete, and for seven cranes. The orders received by the Morgan Company for the week ending April 11 included 14 cranes as follows: Indiana Steel Company, one 15-ton, 58 ft. 6 in. span; two 5-ton, 37-ft. span; one 40-ton 4-motor, 60-ft. span; one 25-ton 4-motor, 60-ft. span; two 5-ton wall; Bethlehem Steel Company, South Bethlehem, Pa. (for new Sacon plant), one 100-ton 4-motor Morgan electric ingot stripper, 50-ft. span; one 10-ton crane, 5 ft. 10 in. span; two 10-ton 56 ft. 3 in. span; one 25-ton 4-motor 59 ft. 10 in. span; San Francisco Railway & Power Company, San Francisco, Cal. (through Ford, Bacon & Davis, engineers, New York), one 50-ton 4-motor crane, 10-ton auxiliary hoist, span 47 ft. 1 in.; Union Steel Casting Company, Pittsburgh, Pa., one 10-ton 3 motor, span 36 ft. 9 in., for new machine shop.

The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, manufacturer of iron and steel roofing and siding, black and galvanized iron and steel sheets, sheeting and expanded metal lath, bridge and fireproof flooring, is operating four hot mills in its plant, and expects to be able to keep them in operation.

Malleable Castings by a New Process.

The Melting of Wrought Scrap in the Crucible and in the Open Hearth Furnace.

At the November and December meetings of the West of Scotland Iron and Steel Institute a paper was under discussion, presented by E. C. Ongley, under the title, "The Production of Malleable Castings by the Fusion of Wrought Iron in Crucibles." As will be noticed, there was some dissent from the statements of the author, and exception was taken to the fact that some details of the process were not divulged. However, since the chief raw material employed is said to be "wrought iron," while the resulting castings do not require to be annealed, and have desirable physical properties, the paper is of interest, albeit the author replied but generally to direct requests for light on the matter of the additions made after the melting of his mixture and preliminary to pouring the molds. It would seem, moreover, that the old materials made use of are largely steel to begin with, in spite of the designation "wrought iron" used by the promoters of the process. A synopsis of the paper is given below, together with the substance of the facts developed in the discussion:

Malleable Castings from the Crucible.

The new process has for its object the production of a metal for making castings, with the properties of steel; also of forged iron, but, unlike the latter in that when fused it can be cast into molds, producing castings with a carbon percentage of 0.05 to 0.07. The raw material, scrap and wrought iron, consisting of scrap nails, bolts, chippings of plates and punchings, is filled into crucibles of plumbago with a cover, and is then placed on a disk pedestal resting on the fire bars of the furnace [the arrangement of the furnace being shown], which is then filled with coke. The four-cornered shaft furnace has a double iron casing, and is lined with firebricks; the blast is heated by circulating in the hollow space round the hot furnace, which is placed in a pit. The process of fusion of the first charge requires about two hours from the time of lighting up, whereas the following charges are ready for casting in about one and one-half hours. The standard furnace can take four crucibles of 100 lb. capacity each, and with four charges daily the weekly output of one furnace would be about 3 tons of castings, as castings, or in the shape of ingots. The waste is very inconsiderable, but the marketable product is about 65 to 75 per cent. of the raw material, the gates and runners, which can be remelted, making up the 100 lb. of each crucible. When the melting process is completed, which can be ascertained by a testing rod after the crucible cover has been taken off, the molten material appears quite white, sometimes slightly boiling; but on the addition of certain materials it is at once quieted, and must be then poured into the mold with as little delay as possible, as the high temperature of about 2700 degrees F. of the metal is an essential feature for the success of this process. The castings do not require annealing.

The sand of the molds, by a suitable addition of refractory materials, ganisters, &c., is prevented from burning on, so that the castings have a smooth, clean surface, and are also sound, free from blowholes, and perfectly homogeneous.

The temperature of 2700 degrees F. must be uniformly maintained to secure the fluidity of the metal, so that it can run out into the finest lines down to 3-16 in. of any pattern, of machine parts, of boiler fittings, valves, &c., which can thus be made lighter than is possible with any other metal with such high tensile strength.

The cost of production is low, as it depends on the price of a raw material, which is a by-product of engineering work, and which consists entirely of waste and scrap of malleable iron and mild steel containing 0.05 to 0.2 carbon percentage; besides this, the cost of the plumbago crucibles—which are good for four or five charges—the consumption of fuel, the wages of the furnace attendant, the additions and general expenses, make a total cost of about £10 to £12 per ton for the material as it runs out

of the crucibles into the molds. The wages for molding have to be added.

Some results of tests are as follows:

	Tensile strength per square inch.	Elongation.—Bars of 3½ in. Per cent.
Forgeable quality.....	22 tons.	32.3
Forgeable and weldable quality.....	23 tons.	32.2
Mild steel.....	24 tons and more.	24.3
Hard steel.....	45 tons and more.	19.5 to 12

On being machined it is found that the surface of these castings does not consist of a hard skin, but is simply of a sound homogeneous material, offering no more difficulty to the cutter or cutting tool operating on it than when a forging is machined. The work of machining is much reduced as compared with forgings, as the margin for tooling can be made very small in the pattern. A shrinkage of 2 per cent. has to be allowed on the patterns. The tensile strength can be varied to suit requirements, by adjusting the composition of the additions to the molten metal. The castings are used for marine engines, boiler mountings and motor car parts. Their high permeability has brought them into use for dynamo work, having higher capacity than cast iron with reduced weight.

The cost of 1 cwt. of metal from the crucible is given as follows. To this is to be added the cost of molding.

	s.	d.
Wrought iron and mild steel scrap with 0.05 to 2.25 per cent. carbon.....	3	6
Cost of crucibles.....	2	6
Coke consumption, 2 cwt.....	2	6
Wages.....	1	6
Furnace expense.....	0	6
Cost of blast.....	0	6
Additions.....	0	6
Total.....	11	6

Malleable and Steel Castings by a Special Open Hearth Process.

Castings are produced on the most favorable commercial scale in the open hearth furnace by melting wrought iron scrap in connection with a special process for the treatment of the molten metal. These castings can be large or small, of soft ingot metal with all the properties of wrought iron, ranging up to hard steel, suitable for parts of machinery subject to heavy wear, or for tools, milling cutters, drills, stamps and dies, valves, gear wheels, &c. The raw material consists chiefly of wrought iron scrap, to which a slight addition of hematite pig iron is made up to 15 per cent., to procure the quality to be produced. The oxides which are developed in the liquid bath are reduced by a corresponding addition of deoxidizing materials; when the liquid metal is ready for casting, certain additions, which constitute the special process, are made to the molten metal in the furnace. The additions are made just before the molten metal is to be tapped, so that its quality can be decided on or changed just before the metal leaves the furnace. By this means the important advantage is secured that castings can be produced at the very last moment to suit urgent requirements, without causing any inconvenience or increased cost. The special process enables the production of castings for all purposes, soft and tenacious, like best wrought iron for shipbuilding, for stern posts, &c., as well as the production of mild steel for machinery, and of steel suitable for tools and other purposes.

The metal is dense and of homogeneous structure, free from blowholes and sponginess. It has been tested with the following results:

Wrought iron quality, tensile strain 20 to 30 tons per square inch; elongation, 18 to 27 per cent.; contraction, 46 to 52 per cent.

Mild and hard steel, tensile strain 25 to 50 tons per square inch; elongation, 10 to 28 per cent.; contraction 20 to 30 per cent.

The following items show the actual cost of production of this metal up to the pouring of the mold for 1 cwt.:

	s.	d.
Wrought iron and mild steel scrap, bolts, nails, &c.....	2	6
Hematite pig iron.....	1	6
Deoxidizing materials.....	0	6
Coal, attendance, &c.....	2	0
Additions.....	1	0
Total cost for 1 cwt.....	7	0

The average cost would be £7 per ton of the metal as it leaves the furnace to be run into the molds. This cost is reduced to £3 and £4 per ton, when the production is on a large scale. The molds have to be coated with a wash of refractory materials to make them stand the high temperature of the metal without being burnt on, so that the castings have a clean and smooth surface. The cores are also specially treated so that they easily part from the castings, thereby insuring a clean surface to the hollow spaces of the castings as well as to their outward surface.

Discussion.

Some skepticism was expressed by those who discussed Mr. Ongley's paper as to any revolutionary features of his process. More light was asked on the matter of the additions. The alloying of iron with aluminum or with silicon was familiar, one of the speakers urged, so that if these alloys were used the process in this respect presented no novelty. The president of the institute said that the heat of 2700 degrees referred to was not unusual. Referring to the low carbon and low silicon material employed in the process, which had been spoken of in the paper as malleable steel or malleable iron, the speaker thought it was rather malleable cast iron. While not employing the process described in the paper he had used scrap with a low percentage of graphitic carbon, phosphorus and sulphur and melted it in a cupola. After annealing the product made first-class malleable castings, almost like steel, which could be forged into tools. He questioned if more than this was done in the practice described.

Mr. Ongley, in reply to the comments of those who discussed his paper, said that the use of the process in connection with the open hearth furnace had gone on for six years and that 18 plants in Germany were employing it, chiefly in making castings for motor car work. Answering the statement that the process was not novel, he said that no works in England melted wrought iron in pots, securing a temperature of 2700 degrees. In Sheffield they melted at about 2000 degrees F. Several West of Scotland firms had sent representatives to Brussels to see the new process at work. The composition of the additions to the molten metal was not generally disclosed, as this was a commercial detail. The materials employed are aluminum, spiegel, iron, nickel, molybdenum, vanadium, tungsten, silicon, wolfram and various other metals known to those in the trade. The proportion of these materials used to the amount of molten metal was not stated, as the object of the paper was not to give full directions for applying the process. When he used the words "special ingredients," he took it for granted that the nature of the materials would be generally known to those engaged in manufacturing steel, and that they would also be aware that nothing of a secret or charlatan nature could have been meant. The furnace described enabled the high temperature to be obtained for keeping the molten metal fluid, and the materials mentioned are added to the metal for the purpose of keeping up its temperature and removing the gases in it. Sound castings as thin as 3-16 in. could be produced. The president's remarks on producing malleable iron from the cupola in Harrington refer only to the production of malleable castings, which have to be annealed before they can be used.

It is rumored in Canadian iron circles that an important legal battle is likely to occur, almost equaling the suit between the Dominion Iron & Steel and Dominion Coal companies. The parties are the Nova Scotia Steel & Coal Company and the Dominion Iron & Steel Company. The dispute is over certain submarine areas at Wabana, Newfoundland. It will be remembered that about six years ago the Nova Scotia Company sold about half of the iron ore areas at Wabana to the Dominion Company for \$1,000,000. After this sale the former company took up additional areas at a considerable distance from the shore, and has been driving a tunnel 1700 ft. long through the Dominion property to reach these distant areas. It seems that some misunderstanding exists as to the correctness of the old surveys, and that the whole matter may be taken to court. Being an extremely

technical matter, involving the determination of the location of ore bodies some distance out under the sea bottom, it is expected to require the brightest legal and technical talent.

Curtis Turbine Business.

A number of interesting facts are revealed in the statement received from the General Electric Company of Curtis turbine sales, which follows:

	Number of plants. Capacity 1,000 kw. and less.	Capacity above 1,000 kw.	Total number of plants.	Average kw. cap. of plants.	Total kw. capacity.
Orders to December 31, 1907:					
Central station and railroad traction...	71	190	261	3,778	986,020
Industrial plants and Miscellaneous	243	45	288	305	87,675
Totals.....	314	235	549	1,956	1,073,695
			Number of machines.	Average kw. capacity per machine.	Total kw. capacity.
Installations to December 31, 1907..			943	857	807,610
Orders on hand December 31, 1907..			153	1,739	266,085
Total sales to December 31, 1907..			1,096	980	1,073,695
Orders for fiscal year ending Febru- ary 1, 1908.....			325	890	286,320

The most noticeable single item is the total capacity sold to December 31, 1907, which is 1,073,695 kw., or about 1,556,000 b.h.p. This is the strongest indication of the advance of the steam turbine generating unit that has ever been published. That this advance is accelerating rapidly is shown by the amount of the sales of Curtis turbine generators for the past fiscal year of the General Electric Company—286,320 kw. capacity, or more than 25 per cent. of the total sales since the Curtis turbine was introduced.

Another fact of considerable interest is the large number of plants for which the Curtis turbine has been selected as prime mover. The large range of sizes in which this turbine in sold is probably responsible for the great variation in average sizes of plants in which it is used. The large central stations and electric traction enterprises with an average size of 3778 kw. plant capacity strikingly differ from the industrial plant of 305 kw. average capacity.

Purdue Students Visit Chicago Plants.

A body of 175 students from Purdue University, La Fayette, Ind., under the leadership of Prof. C. H. Benjamin, dean of the engineering schools of that institute, visited Chicago April 14-16 for the purpose of visiting some of the large industrial plants in the city and vicinity. Upon arrival at Chicago the party was divided into three classes, comprising the mechanical, electrical and civil engineering divisions. Among the plants visited by the first division were the South Works of the Illinois Steel Company, works of the Pullman Palace Car Company, foundry of the Griffin Car Wheel Company and the Fraser & Chalmers shops of Allis-Chalmers Company. The electrical division inspected the equipment of the Chicago Telephone Company, Edison storage battery plant, Commonwealth Electric power station and Illinois Tunnel & Telegraph Company's tunnels. The section of civil engineers visited the water works cribs, Chicago River bridges, shipyards of the Chicago Shipbuilding Company, American Bridge Works and other points of interest. Establishments generally regarded as closed to technical visitors were freely opened to the visiting students, and local guides were furnished to explain mechanical operations and processes. On the same dates a similar party of students from the University of Illinois were in the city engaged in a like tour of inspection under the leadership of professors J. P. Brooks, Ira O. Baker and F. O. Du Four.

A Chicago dispatch says it is estimated that by June 1 the railroads centering in that city will require more than 100,000 laborers for repair work, both on tracks and in shops.

Malleable Iron Castings.*

Comparison of Furnaces Used and Methods of Annealing.

BY C. H. GALE.

Malleable iron is melted in the reverberatory furnace, the open hearth furnace and the cupola. The reverberatory furnace is the most extensively used, about 85 per cent. of the entire output of the United States being melted by this process. But little change has been made in this type of furnace since its adoption by the earlier manufacturers, beyond a marked increase in capacity. Prior to about 1885 the standard furnace was one of 5 tons capacity. This has been increased from time to time, until at the present time we have furnaces of 25 and 30 tons capacity, though furnaces of from 10 to 15 tons capacity are the most popular, and give more uniform results than those of larger capacity.

The adoption of the open hearth furnace for malleable iron dates back about 15 years. This type of furnace is now used largely and successfully in this district, more than 50 per cent. of the malleable iron made by the open hearth furnace being produced in the Pittsburgh District. This success, which has not always followed the introduction of this furnace in the malleable foundry, can be attributed to the local familiarity with this type of furnace from its extensive use in our steel mills.

The Several Types of Furnace Compared.

The open hearth furnace has many advantages over the reverberatory furnace, especially where the output is large, and orders guarantee a long, steady run, the chief advantages being cost of repairs and period of operation. A run of 300 to 400 heats without the loss of a single day for repairs is not uncommon. Then will come a shutdown of a week's duration for minor repairs and cleaning out, putting the furnace in condition for another like run. This long, uninterrupted run, to the operator of the reverberatory furnace, when customers are calling for deliveries, and who at the most can get but a week of uninterrupted service, or 12 to 18 heats from his furnace, seems like the dawn of the millennium.

After 1200 or more heats the open hearth furnace will need a general repair requiring four or five weeks, and here in the length of time required to make these repairs is where the reverberatory furnace has the advantage, it being a not uncommon practice during a busy season to rebuild the side walls, repair bridge walls and put in an entirely new bottom with the loss of one or at most two days' time. During a very busy season these repairs are frequently made on Sunday, thus avoiding the loss of a working day. Moreover, the reverberatory furnace can be charged within a few hours after these repairs are completed, while the open hearth furnace requires as many days to be brought to the required temperature before receiving the charge.

A heat of iron, after being melted and brought to the proper condition for casting, can be held in the open hearth furnace without injury for a much longer period than in the reverberatory furnace, not being subjected to the intense oxidizing flame of the latter, especially that produced by the use of the top blast.

Cupola melted iron does not possess the tensile strength nor ductility of iron melted in the reverberatory or open hearth furnace, due partly to the higher carbon and sulphur caused by the metal being in contact with the fuel. This feature is rather an advantage than otherwise, as most of the product of cupola melted iron consists of pipe fittings—castings that are not subjected to any great stress or shock. These castings are threaded, and a strong, tough malleable iron does not cut a clean, smooth thread, but rather will rough up under the cutting tool.

Annealing.

The annealing process for malleable castings differs

* A paper read before the Pittsburgh Foundrymen's Association, April 6. Mr. Gale is superintendent of the Pennsylvania Malleable Company, Pittsburgh.

from that of steel castings in that in the case of steel when recalcence, or the refining temperature, has been safely reached, it is needless or rather unwise to prolong the heat, while in malleable iron the annealing process has at this period but begun. This heat must be maintained for from two to four days, depending upon the thickness of sections of the castings under treatment and the compactness with which the castings or annealing boxes are placed in the furnace. The annealing temperature, 1550 to 1600 degrees F., is, however, not absolutely essential to thoroughly anneal malleable iron. This can be accomplished at a temperature as low as 1300 degrees, but the time required will be at least twice that of the higher temperature.

There are but few concerns engaged in the business for any considerable time with whom there has not been tried out the process of annealing without surrounding the castings with a packing material, but the heavy scale formed on the castings and their general unsightly appearance, together with a refusal of acceptance on the part of the customer, soon convinces the experimenter of the folly of continuing the process. Malleable castings can be annealed without the aid of any packing material and still preserve their appearance, and without the formation of scale by placing them in an airtight receptacle excluded from the flame and gases in the furnace; however, as economy of production is the objective point sought, this process has nothing to commend it.

Material Used for Packing.

Until recent years the material in which castings were packed for annealing was composed of hammer and rolling mill scale, turnings, borings, &c. This was treated with a solution of sal-ammoniac or muriatic acid to form a heavy coating of oxide. This method has, however, been nearly superseded by the use of slag. The slag that is skimmed from the bath of the melting furnace, when ground to pea size and smaller in a tumbling barrel, makes an excellent packing material. Care should be taken to cool this slag with water as it is being skimmed from the melting furnace, it being the custom in some foundries to use old sand with which to deaden the heat. Better results can be obtained from this slag in the annealing furnace if kept quite free from sand and dirt.

Many malleable foundries in the vicinity of blast furnaces, where granulated slag can be had at a small cost, use this for annealing, it being probably the most economical. Fire sand and fire clay are also used, fire sand being an excellent material where the castings are very light and of intricate shape. Such castings, when packed in sand, will retain their shape, even though the furnace be overheated. This sand, however, deteriorates very rapidly if not renewed. Experiments conducted without the addition of new sand gave the following results: First and second times of using gave good, well annealed castings; third and fourth times of using gave castings with a fair anneal, but showed a tendency to weakness; fifth time showed a still weaker casting, while the sixth and seventh times the sand was used produced castings of but little more strength than the original hard iron, and they had to be returned for reannealing. After the seventh time of using the sand resembled a heavy wood ash.

The theory of oxidizing the scale and borings that was adhered to so long was that the castings would become decarbonized by the oxygen in the packing material combining with the carbon in the castings, the large percentage of iron oxide in the furnace slag, about 50 per cent., being the principle that first led to its substitution for scale and borings, but that the presence of a large percentage of this oxide is not essential is proved by the results obtained when annealing with materials containing little or no oxide. Many malleable foundries where scale and borings are still used have discontinued the oxidizing of this material with sal-ammoniac or acids.

Physical Characteristics.

The physical characteristic that gives malleable iron its greatest value, and wherein it differs from gray iron, lies in its ability to resist shocks and an increased tensile strength. The degree of malleability in light and

heavy castings varies. In a light casting $\frac{1}{4}$ in. thick and less, it means a soft, pliable condition and the ability to withstand considerable distortion without fracture, while in the heavy sections, $\frac{1}{2}$ in. and over, it means the ability to resist shocks without bending or breaking.

The tensile strength of malleable iron varies with the thickness of the metal, the lighter sections having a greater strength per square inch than the heavier sections. This fact is now being recognized by engineers and at least one Eastern railroad, which requires its malleable castings made in accordance with specifications, designates the tensile strength desired in its castings to be as follows: Sections $\frac{3}{8}$ in. thick or less should have a tensile strength of not less than 40,000 lb. per square inch.; those of $\frac{3}{8}$ to $\frac{1}{2}$ in. thick, not less than 38,000 lb. per square inch, and those over $\frac{1}{2}$ in. not less than 36,000 lb. per square inch. In recent tests along these lines, test bars $\frac{5}{8}$ and $\frac{3}{4}$ in. in diameter were made in the same mold and poured from the same ladle, thus insuring equality of metal, and annealed together. The average tensile strength of five pairs of bars so treated, representing five heats, was: $\frac{5}{8}$ in. bars, 45,095 lb. per square inch; $\frac{3}{4}$ in. bars, 41,316 lb. per square inch. Average elongation in 6 in.: $\frac{5}{8}$ in. bars, 5 3-10 per cent.; $\frac{3}{4}$ in. bars, 4 2-10 per cent.

A very high tensile strength can be obtained approaching that of cast steel, but at the expense of the malleability of the product. The writer has seen malleable test bars having a tensile strength of between 60,000 and 70,000 lb. per square inch, but the ductility and ability to resist shocks of these bars were not equal to that of bars breaking at 40,000 to 45,000 lb. per square inch.

The Strength Not in the Skin.

It was formerly the general belief that the strength of malleable iron was largely in the white skin always found on this material, but it has frequently been demonstrated that the removal of the skin does not proportionately lessen the strength of the casting.

The process of annealing is one of conversion of carbon, there being practically no change in the other elements. The carbon in the original cast state is all in the combined form, this being converted by the heat treatment to graphite. This graphitic carbon, however, differs from that present in pig iron or gray iron castings, a difference that is readily noticed by the chemist. Instead of being present in crystals or grains distributed throughout the metal, it presents itself in an amorphous state, extending through the metal in minute filaments.

Besides the conversion of carbon, there is also a partial elimination of carbon, the loss being greatest in the white skin, the carbon content of which will vary from 0.10 to 0.20, while the interior of the casting will have a total carbon of about 2 per cent. The percentage of loss of carbon is, however, not constant, varying with the material with which the castings are packed for annealing. With a carbonaceous material, as coke, the carbon loss is less than with slag or scale, while castings annealed in coke have a higher sulphur content than before annealing, due to the absorption of this element from the coke.

The following analysis will give a good average of the changes in the elements during the annealing process, slag and coke being used:

	Si.	S.	P.	Mn.	C. C.	G. C.
Hard Iron.....	0.63	0.043	0.147	0.21	2.54	Trace
Annealed in slag...	0.61	0.049	0.145	0.21	0.24	1.65
Annealed in coke...	0.61	0.065	0.150	0.21	0.25	2.00

The casting of direct malleable iron, thus eliminating the tedious and expensive annealing process, is a very alluring proposition to the manufacturer, but despite the best efforts of the founder and metallurgist it still remains an iridescent dream, holding in abeyance the fame and fortune of its discoverer until the solution of its fellow problem, the conversion of iron into gold.

The commissioners of Allegheny County, Pittsburgh, have granted petitions for two bridges, one over the Ohio River at Sewickley, and one over the Allegheny River at Oakmont, the two structures to cost about \$500,000 each.

The Fort William Car Works.

TORONTO, April 18, 1908.—An act relating to the city of Fort William is among the measures passed at the session of the Ontario Legislature that has just risen. A section of this act enables the municipal corporation of Fort William to give effect to a by-law passed by the City Council last winter and approved by a majority of the ratepayers. The by-law in question is one to establish an agreement between the City Council and the Fort William Car Company. Of itself the by-law lacked force because the majority in favor of it did not amount to two-thirds of the total number of ratepayers in the municipality. Hence the Legislature was invoked to give it validity. This the new legislation referred to does, but it also adds conditions over and above those embodied in the preliminary agreement between the city and the company. First, the by-law is not to be finally passed until the company furnishes satisfactory evidence that it has actually sold \$1,200,000 of its authorized bond issue. The company must further show that 10 per cent. of its authorized capital stock is paid up in cash and deposited in some chartered bank. It is also required to secure two reputable Canadians of financial standing to become substantially interested in its affairs and take places on its Board of Directors. If the company fulfils these conditions before the first of January next, then the by-law may be passed and acted on by the City Council. The City Council may then enter into the agreement attached to the act and may raise and pay over the \$50,000 called for by that agreement. This bonus is to be a contribution to the cost price of the company's site. It is not to be paid, however, until the company has expended \$500,000 in the erection and equipment of its plant. The agreement further requires the city to exempt from municipal taxation all the company's Fort William property in excess of \$100,000. In the third place the municipality agrees to guarantee the interest at a rate not exceeding 6 per cent. on \$600,000 of the company's bond issue. The guarantee is to be affixed on each \$100,000 of the bonds after an equivalent expenditure in each case upon construction. The city has the right to appoint one director.

On the company's part the agreement calls for a plant to cost \$500,000, exclusive of the value of the site, such plant to have a capacity of 24 freight cars per day and one passenger car. The freight car capacity is to be reached within 18 months of the date of the agreement, and the passenger car part of the works is to be completed within three years. By the end of the first year of operation the company is to have 500 hands at work, and this number is to be increased by 250 annually until 1500 men are employed. In time the works are to be enlarged for an output of 60 freight cars per day and two passenger cars.

The agreement in which the parties are to join under the act contains the substance of the original agreement, entered into in October last and signed by Albert H. Sissons, Ralph Waldo Morrison and Redpath & Co. Mr. Sissons and Mr. Morrison are understood to be connected with the St. Louis Car Works. They are to be directors of the company. Redpath & Co. are of Montreal. Two other Montreal men named in the agreement of directors are S. H. Ewing and Samuel Carsley. The two latter or Canadians of equal financial status are required by the act, as well as named in the agreement, to serve on the company's board. The company has a Dominion charter, and its authorized capital is \$1,500,000, a bond issue of equal amount being also authorized.

C. A. C. J.

The Clark Novelty Company, Rochester, N. Y., has added to its equipment a thoroughly modern nickel plating plant. For lack of sufficient room in the factory, this long felt want had not been installed. The company is now in position to do its own work in this line, and expects also to contract for outside work. Its products are going to every country on the globe. While its line is principally the manufacturing of metal specialties and special devices, machinery and tools, it makes and markets a line of brass faucets and other goods made of brass and iron castings, brass and steel rods, &c.

German Machines and Tools.*

Special Tools Not Made in the United States.

Special Agent Capt. Godfrey L. Carden of the United States Revenue Cutter Service, now investigating trade opportunities for the sale of machine tools, sends from Berlin, under date of February 11, the following description of certain tools made by a German firm:

The machine tool manufacturing plant of Ludwig Loewe is turning out three special tools of a type not made in America. Two are backing-off lathes, the third a circular milling machine. Still another special appliance of this firm is an automatic indexing apparatus for universal milling machines.

One backing-off lathe has automatic cross feed and is designed for backing off formed milling cutters with straight flutes. The cutters are first roughly formed and grooved, the number of teeth ranging from 3 to 25. This is a stiffly built lathe, and backs off without much vibration. The backing-off tool is moved forward by a cam and returned rapidly by springs. The movement is regulated by change gears and cams to correspond with the number of teeth on the cutter. Each tooth is so relieved that it retains its form, although nearly ground away by repeated sharpening. The bed is of box form, cast in one piece with the headstock. The spindle is hollow, has hardened and ground bearings, and runs in bronze boxes, which are scraped by hand to a fit, the front box being provided with means for compensating for wear. The drive is by a three-step cone through a worm gear, so that the machine will take a steady cut when working on broad surfaces. The cross slide is so arranged that the tool is automatically fed in at each revolution of the work spindle, the idea being to enable one man to look after more than one machine.

The other backing-off lathe has a greater capacity than the tool above described. It is furnished with a lead screw and feed rod, and will back off taps, spiral cutters and worm gear hobs, either right or left hand, as well as the ordinary form of backed-off cutter, having from 3 to 26 teeth. This tool has a taper attachment and a complete set of change gears for screw cutting. The bed rests on legs of box form. The spindle is as above described. The belt feed has six changes and is reversed by a lever on the apron. The headstock has an attachment by which the pitch of thread obtained by the change gears can be increased twelvefold. On the tool post there is a screw adjustment for bringing the backing-off tool into exact position.

The circular milling machine is designed to take the place of the lathe for work of such forms as can be produced by milling cutters—viz., gear wheel blanks, either spur or bevel, grooved pulleys, hand wheels, flange pulleys with crown face, &c. The claim is made that one man can easily keep as many as five machines in operation, and that if the cutters are made with backed-off teeth, not only is uniformity in the shape of the work secured, but the parts are machined more cheaply than on the lathe. The cutter spindle is of steel, has hardened and ground bearings, and runs in long bronze boxes, of which the front one is adjustable for wear. The spindle is provided with a draw in bolt for the cutter arbor, and is driven by back gears having a ratio of 1 to 7. The outer end of the cutter arbor is supported by a movable tailstock, which must be taken away before milling internally. The cutter and the work are brought to a standstill simultaneously at each complete revolution of the latter by an automatic stop. The head is adjustable in both directions horizontally. It can be clamped firmly in place, and an adjustable stop is provided which insures the head being brought back to the same point for duplicate work. The work spindle is driven by a worm gear, which can be disconnected and the spindle directly revolved by a hand wheel; changes of feed are made by means of change gears. The outboard bearing supporting the outer end of the work arbor is carried on a knee, which can be swung aside when putting in or removing the work.

* From *Daily Consular and Trade Reports*, issued by the Bureau of Manufactures of the Department of Commerce and Labor.

What the Loewe Works Produce.

In addition to the above the Loewe works manufacture plain milling machines, with and without automatic feed of table, parallel and vertical, and with and without back gears; automatic screw machines, cutting-off machines, vertical milling machines with rapid turning spindles, automatic spur gear cutting machines, semi-universal automatic bevel gear cutting machines, automatic pin and stud machines, turret lathes, and screw cutting lathes for copper stay bolts.

In design the Loewe machines follow American practice more closely than European, although they are in nearly every case heavier than the usual American type. The different features which they present, while said to be dictated by European demands and methods, would not always agree with what is deemed best in America.

The Loewe people lay great stress on grinding work. All important cylindrical parts are finished on the grinding machine. Sliding surfaces are finished by hand scraping. They have interested themselves in the Norton machines and will undertake producing that type of grinder in Germany. While they naturally rate their own products high, they concede that the most advanced chucking machines, radial drills, upright drills, circular and universal grinding machines, and bevel gear shaping machines are to be found in America. There is a very complete physical and chemical laboratory at Loewe's, and it is because of the thoroughness of the laboratory work the firm is able to ship a good many castings to America. These are mostly cylinders for automobiles and locomotives.

The Borsig Works.

In the Borsig machinery plant, located at Tegel, near Berlin, 5300 men are employed, and it stands in the first rank in Germany in point of shop efficiency. The American who wishes to become acquainted with German progress in machinery can see nothing finer than is offered at the Borsig shops. The methods in vogue are practically those followed in similar large works in the United States. In the shops there are many old tools which will probably be gradually replaced with tools of late make. Only one English tool is in service; all others are either German or American make. The American makers represented are: Potter & Johnston Machine Company, Pawtucket, R. I.; G. A. Gray & Co., Cincinnati, Ohio; Prentice Brothers Company, Worcester, Mass.; Garvin Machine Tool Company, New York City; J. E. Snyder & Son, Worcester, Mass.; Brown & Sharpe Mfg. Company, Providence, R. I.; Norton Grinding Machine Company, Worcester, Mass.; Gisholt Machine Tool Company, Madison, Wis., and the Niles Tool Works, Hamilton, Ohio. Among the principal German makes are those of Ludwig Loewe and Deutscher-Niles, Berlin; Ernst Schiess and de Fries & Son, Düsseldorf; Reinecke, Chemnitz; Dortmunder Maschinen Fabrik, Dortmund, and Schmaltz, Offenbach-on-Main.

The Borsig firm is building at present locomotives, hydraulic presses, steam engines, ice machines, boilers and compressors. The tendency is to specialize. Not long ago this firm dropped the building of gas engines. The same plant manufactured tools to a limited extent, but does not engage in that work now, except for its own use. Aside from the locomotive work, its specialty may be said to be hydraulic presses. This firm has devised and uses an air testing machine, by which all pneumatic tools offered for sale are tested to ascertain the expense of operation. This fact may not be known to some American manufacturers, and it is interesting to observe that the Borsigs are only using at present American pneumatic tools. These tools would not have been bought did they not show superior merit to the tools offered from German and other sources, and all of these tools were subjected to test before being purchased.

The writer learned that some Saxony firms have recently been making substantial purchases of machine tools, and that American manufacturers having machines in stock here have benefited by these orders. The automobile manufacturers are heavy buyers of American machine tools, but this trade is quiet now, owing to the general situation of the money market. The grinding machines of American make are, perhaps, having a better

run during the present quiet times than most American machines, and the tendency here seems to be in the general direction of greater use of grinding tools than heretofore. So far the American machine of this type is recognized as unquestionably superior to those of German make.

Aid for Canada's Tin Plate Industry.

TORONTO, April 18, 1908.—Tin plate is to become subject to the anti-dumping duty on May 1. Until quite recently the Government was not convinced that the conditions entailing this special duty existed in the case of tin plate. Of course no article can be assessed for this duty unless such article is shown to have been bought by the Canadian importer at a price below that current in the country whence it came. Very possibly the Government was satisfied that tin plate for Canadian use was being purchased in the United States and in England at lower prices than those ruling there, but it had its doubts that the home manufactured supply of tin plate was adequate. The section of the Tariff act prescribing the dumping duty requires that the articles subject thereto be "of a class or kind made or produced in Canada." It is further provided that in the regulations which the Minister of Customs is empowered to make for carrying out the anti-dumping duty law, he may temporarily exempt from this special duty articles of any class which he is aware is not made in Canada "in substantial quantities and offered for sale to all purchasers on equal terms under like conditions, having regard to the custom and usage of trade." As the works of the Tin Plate & Sheet Steel Company at Morrisburg were the only ones turning out tin plate in Canada, as their operation began only last December, and as their output was for a time suspended as a consequence of fire, the Government did not see its way to declare tin plate subject to the anti-dumping duty. It has now apparently been persuaded that in quantity and quality the company's tin plate is satisfactory, and the anti-dumping duty is to come into effect on May 1. That duty cannot exceed 15 per cent., no matter how great the disparity between the price paid by the importer and the current price in the market of purchase.

That there has been price cutting by American sellers in Canada seems unquestionable. Quotations on English tin plate to Canadian buyers are reported as low as \$3 to \$3.10, and it is alleged that American makers have competed. An English manufacturer of tin plate is credited with the statement that Canada is the cheapest tin plate market in the world. That, to be sure, is satisfactory to Canadian consumers of tin plate, whose aggregate demand is quite large, it being estimated that 75,000 tons of steel is made into tin plate, galvanized sheets and Canada plate for the use of this country. That the price cutting on the part of American and English sellers in Canada was for the purpose of underselling the Morrisburg company appears obvious from the fact that prices were put up 30 cents a box immediately after the fire at the company's works.

But the benefit of the anti-dumping duty is not all the company asks. It wants a bounty of $\frac{1}{2}$ cent a pound on its product. It seeks a bounty because the Government's answer in 1906 discouraged the expectation of a protective duty. It would have caused no surprise had Mr. Fielding announced among the tariff changes inaugurated in November that of a duty on tin plate, but he took the ground that a commodity entering so largely into the necessities of life ought not to be made dutiable for the advantage of one company. He yielded, not to the importunity of the company, but to the outcry raised by the salmon packers of British Columbia, the fruit and vegetable packers of Ontario and Quebec, and the lobster packers of the Maritime Provinces. At the same time in his budget speech the Minister admitted the desirableness of having another development of the steel industry of the country. That the company will obtain the bounty it is applying for is possible, but does not seem probable. True, the bounty method of aiding industry seems to commend itself to the present Government more than the method of protective duties. But the popular feeling toward bounties is one of growing antipathy. That is

particularly so in Ontario, the province whose consumption of merchandise and whose contributions to the revenue are the greatest. The last renewal of the iron and steel bounties provoked an agitation that does not subside. Possibly if the company had asked for a 15 or 20 per cent. duty it might have persuaded Mr. Fielding, but a 35 per cent. rate was more than he could countenance.

C. A. C. J.

Brass and Copper Rolling Mills.

The geography of the metal rolling industry, particularly of brass and copper mills, is reviewed as follows by the *Metal Industry*:

The distribution of the metal rolling mills of the United States indicates how the manufacturers of brass and copper have followed the various industrial centers after the establishment of the industry in Connecticut some 100 years ago. The foremost district has been and is the Naugatuck Valley, with the city of Waterbury, Conn., as its center. Here are located the greatest number and the largest mills, and additions and new mills are built year after year, despite the fact that about the only raw material of any account found in the State of Connecticut which is used in the manufacture of metals is chestnut wood. The industry has been founded, developed and expanded by the metallurgical and mechanical genius of the Connecticut Yankee, not from its nearness to the base of supplies. The establishment of the metal rolling mill industry in this section of the country has also brought a host of various metal goods manufacturers, or cutting-up shops, as they are known, and also many machinery builders to make the tools and machines required in all of the metal working factories. That the works of all of these various manufacturers are still growing is evidenced by the improvements and expansions of the last few years.

Leaving Connecticut the metal rolling mill industry goes West almost in parallel lines. First comes the State of New York, with plants in New York City, Hastings-on-the-Hudson, Rome and Buffalo, all representing large works with modern equipment and each having developed, or promising to develop, notably Rome and Buffalo, the usual subsidiary shops. The next rolling mill center in the Western advance is Detroit. Plans have been under way some time for the organization of a rolling mill company at Chicago, but they have not materialized and in the meantime Detroit has forged ahead, with two tremendous mills, a number of metal goods factories, and is the greatest brass foundry and finishing city of the country, having some extremely large works devoted to founding and finishing.

The last center West in the brass rolling mill industry is Kenosha, Wis., which has a notable plant, besides the usual number of metal goods shops. This, like the rest of the mill sites, is a growing center and promises further development. Besides the great brass and copper mills outlined above, there are scattered through the industrial section of the country a number of large mills which roll copper only and many small mills which draw small sized tubing and roll silver, lead and other metals. The copper mills are located mainly in New Bedford, Taunton, Belleville, N. J.; Baltimore, Pittsburgh and Lisbon, Ohio, and the small tube works and other mills are all in the States of Rhode Island, Connecticut, New York and New Jersey. Besides the metal rolling mills mentioned there are the aluminum rolling and drawing mills located at different points in the States of Pennsylvania and New York.

The only industrial section of the country which has not yet been invaded is the Pacific Slope, and no doubt the growing metal needs of that section of the country will be sufficient at some distant day to make it profitable to establish a mill on the Pacific seaboard.

Andrew Carnegie has offered to give \$3,000,000 additional to the Carnegie Technical Schools in Pittsburgh, provided the city of Pittsburgh purchases more ground adjoining the present schools, which will perhaps cost \$1,000,000. The offer of Mr. Carnegie is now under consideration by the Pittsburgh city officials.

THE IRON AGE

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						HARDWARE EDITOR.

The South and Industrial Investments.

The progress of the South from the conditions of 40 years ago to those of to-day, as has been said over and over, is a marvel of growth and has few parallels. This must be granted, in spite of the fact that much of the testimony of the Southern champions of the industrial South has been given in the future tense and in the superlative degree. There have been times in this 40-year period, and not so far back as to be forgotten, when any writer who told the exact truth about Southern industries, and applied to them the same yardstick used in making similar measurements in the North, was classed as hostile. If glowing predictions were not forthcoming, that was *prima facie* ground for search to discover the reason of the writer's antagonism. The calculations of the early exploiters of the South—many of them, too, learned the promoting trade north of the Ohio and the Potomac—made the shortest cut between "natural resources" and dividends; and many investors in the North learned again that no climates and no soils have any exemption from old fashioned economic laws.

What is said above is with no thought of reviving unpleasant chapters in Southern development, but to emphasize a contrast with the present. To-day the plainest spoken critics of the South are within the South. It is now coming home to many citizens there that much more than mineral wealth and forests and large cotton acreage is needed. Addressing the Greensboro, N. C., Chamber of Commerce 10 days ago, Richard H. Edmonds, of Baltimore, said: "Dormant natural resources may fill our hearts with pride, but they will not fill our pockets with money. The South of all sections can least afford to participate in any agitation against corporations, and especially railroads. Of all sections it can be most benefited in every respect by leading in the suppression of this agitation." The fact that the South has not equaled the pace of the rest of the country in the industrial race was commented on, and the need of the South was said to be more men and more money from outside. The word must go out, it was argued, that men and capital will find it profitable and pleasant to make their home within its borders. It was made plain by the speaker that railroad balking must cease and that the South, more than any other section, can gain by reassuring investors who have made her railroads possible.

If any proof were required that the free investment of money in the South needs to be encouraged the iron industry can supply it. Ordinarily regarded as one of the chief props of the industrial South, iron and steel manufacture there has been by no means a road to wealth.

Millions have been poured into the South to open iron and coal mines and to build coke ovens, blast furnaces and steel works, but in comparison the amount thus far taken out in dividends on these investments has been pitifully small. In the case of the largest company the call for new money has been unending. Not only has practically all that has been earned in good times been turned back into the property, but to-day, after two years of steady outlay on new work calling for \$6,000,000 to \$7,000,000, a further campaign of expenditure is announced, and that is certain to be followed by another. But the record of the Tennessee Company in the absorption of capital is not unique. Just now another Alabama iron company is floating a bond issue to cover improvements completed and projected. A third Alabama iron and steel company, which has been in receivers' hands for some months, requires \$2,500,000 to \$3,000,000 to pay off obligations, make improvements and supply working capital. A fourth company is reorganizing, after a friendly receivership suit, and the new plan provides for additional capital, the reduction of bonded indebtedness and thereby the lessening of burdensome fixed charges. In the case of a fifth enterprise, a blast furnace plant built by men of experience in the iron trade, and put in operation in time to get the benefit of the large profits possible in the past five years, is now idle and the investments of the original stockholders are a total loss. The above examples of the extent to which Southern iron properties draw upon the resources of those who invest in them are well known and belong to the present or the immediate past. By drawing upon information not so generally public property the list might be lengthened. And if history were gone into—but that is a record which friends of the new South are willing to forget.

It is not the purpose of this article to discuss the reasons for the long delay in the fulfillment of the abundant promises of profit made for the Southern iron industry. They are various. It is enough to say that the counsel of those who see how legislation has added to the disabilities of the South should be heeded while there is time. In the recent flood tide of prosperity the inadequate facilities of the Southern railroads was a constant handicap to the profitable operation of iron and steel plants. In the South alone the new track that should be provided would keep the rail mill at Ensley busy for two years at a stretch. The "money from outside," which it is the Southern habit to look for for all great industrial development, will not be tempted from its place of security while legislatures and governors in that section maintain a war footing against railroads. It is high time that the serious aspect of this situation had recognition; for unless needed millions are soon secured for the proper extension and equipment of railroads the growth of the South may be stunted for years.

The Shrinkage in International Trade.

The statistics of the foreign commerce of the United States in March, taken in connection with reports from the leading exporting countries of Europe, show the settling of the world's trade into narrower channels. In Germany, in particular, the developments of the past few months have followed quite closely in the wake of the liquidation that has been under way in the United States. There, as here, the supply of capital proved inadequate to the requirements of a great industrial expansion. While the distrust created in the United States by the disclosures concerning high financiers was not paralleled in Germany, there is no doubt that in that country, as well

as in England, the American situation has been and will be for some time a distinctly untoward influence.

The March exports from the United States were valued at \$141,397,578, and the imports at \$89,113,830. The former show a decline of \$64,375,000 from January and \$26,360,000 from February, while from March, 1907, the decline is \$20,288,000. The imports were \$4,117,000 above the record of January and \$4,358,000 above that of February. From March, 1907, the decline in imports is \$43,997,000. The quarter ending March 31 showed exports of \$514,927,000 and imports of \$258,867,000, the former being \$4,428,000 more and the latter \$123,836,000 less than for the first quarter of 1907. The heavy decline in imports gives the unprecedented balance of trade for the March quarter of \$256,059,807, the nearest approach to it being \$164,060,645 for the first quarter of 1901. The falling off of \$20,000,000 from the March exports of last year was almost entirely in agricultural products, cotton alone showing a decrease of about \$18,750,000. The decline of nearly \$44,000,000 in imports compared with March, 1907, is largely in luxuries.

Statistics of Great Britain's foreign iron and steel trade are available, showing that in the first quarter of the year the exports were 989,259 gross tons, as against 1,268,135 tons up to March 31, 1907. The falling off is about 279,000 tons, or 22 per cent. Of the decrease about two-thirds is contributed by pig iron, which fell off 181,000 tons, or from 483,000 tons to 302,000 tons. The flatness in the iron trade of the United States accounts for most of this, our imports of British pig iron in the first quarter of 1907 having been 180,273 tons and in the same period this year only 10,643 tons. Germany took 7000 tons less this year than last, to March 31, Belgium 15,000 tons less and Canada 13,000 tons less, while Italy increased its shipments from 41,000 to 48,000 tons, besides taking a few thousand tons this year from the United States. The principal declines in British exports of finished iron and steel for the quarter were 15,000 tons in rails, 15,500 tons in steel bars and angles, 34,000 tons in galvanized sheets and 24,000 tons, or 33 per cent., in plates.

Early in the present depression in American iron and steel a tremor went through the British iron trade in view of the possibilities of dumping. In the first quarter of this year anxiety gradually gave way to the belief that nothing serious in that direction was in store. In the past few weeks, in view of the disappointing course of both the American and German iron trades, the bugaboo of competition from both countries is once more conjured up by British pessimists.

A Notable Result of a Great Fire.

The city government of Chelsea, Mass., has voted to enact rigorous building laws before the erection of new structures shall begin to replace those destroyed. An exceptional opportunity for progressive action in this direction is afforded, constituting an outcome of the great fire of April 12 which should be far reaching in its effects as an example to other communities when their own ordinances are amended in keeping pace with the times. Chelsea is hemmed in between thickly built sections of the immediate suburbs of Boston, a location that has its duplications in all of the larger cities, especially those old enough to contain a large percentage of the ramshackle construction which characterized the buildings of the period before the means of fireproofing had been provided for.

A great area, approximating a square mile, thickly covered with buildings, has been completely destroyed, so

that practically every wall will be razed before new construction can begin. There will be little difference between the old and the new city as to proximity of buildings, unless it be that density will be increased. Therefore the necessity for the application of the most modern ideas of fireproof or slow-burning construction is imperative. Anything but the strictest of building laws, founded on the most recent lessons taught by the science of design and materials, will result in the deteriorating influences which would again subject the city to the peril of conflagration should a combination of unfavorable conditions unite with fire. The opportunity exists to advance beyond the usual limits of building ordinances. Baltimore and San Francisco have done this as large cities. Chelsea can do it as a smaller community. The new construction will include factory, business and residential buildings, probably in somewhat haphazard combination as to location. Laxity of laws governing the building of one class of property will threaten those erected on better principles.

Modern progress in fireproofing materials and architecture has been very rapid. Concrete and metal have taken important places, while the difference in cost as compared with wood has grown less, partly because of the increase in price of lumber and partly because fireproof materials are less expensive, all things considered. The item of roofing alone shows a vast betterment.

With evidences of the great catastrophe on every hand, the city authorities must be impelled by circumstances if by no other motive to proceed with a strong hand in framing their new laws. Doubtless owners of property will co-operate with them, each to protect his own interests. A city built on the lines as suggested would benefit in many ways. Its class of tenants, both residential and industrial, would be higher. Insurance rates would correspond with the degree of fire risk. Property would deteriorate less rapidly. The cost of maintenance would be less.

Some impetus will be given the metal trades, directly and indirectly, by the rebuilding of Chelsea. Even if the new building laws do not depart from the ordinary, as compared with those of other cities, the benefit to trade will be considerable. But the greatest good, considered from all standpoints, business and otherwise, will come with modernizing the city's construction to the limit of judicious effectiveness as to protection from fire.

The Iron and Steel Works Directory.

The American Iron and Steel Association, 261 South Fourth street, Philadelphia, has issued the seventeenth edition of its invaluable *Directory to the Iron and Steel Works of the United States*, corrected to March 1, 1908. This edition of the directory embraces 516 pages, including the index, and forms a larger volume than any of its predecessors. It maintains the arrangement of the previous editions, giving a complete list of the blast furnaces, rolling mills and steel works in the United States. Classified lists are given of wire rod mills, rail mills, structural mills, plate mills, sheet mills, skelp mills, tin and terne plate works, Bessemer, open hearth and crucible steel works and steel castings plants.

This work from its inception has had a peculiar value in iron trade literature. It has been a fountain of information regarding the various plants of the country, and the new edition faithfully carries out the scheme which has always been in view. Whenever possible the history of each plant has been preserved, giving the date of its erection, with all subsequent additions to the plant, changes in ownership, if any, &c. In many instances the equipment of the plants has been more fully described than in previous editions and more attention has been given to the organization of companies, including the

capitalization and list of officers. An exact system of cross references, adopted in previous editions, shows the relation of each plant to other plants under the same ownership. The alphabetical arrangement of previous editions is retained. A comprehensive table of contents and a complete index are among the valuable features. The statement is made that in the preparation of this edition of the directory the services of four experienced clerks have been constantly engaged for 18 months. As the book is larger than any of the previous editions, the price has been advanced to \$12 per copy.

Number and Capacity of Iron and Steel Works.

The following table gives the number and annual capacity of the various classes of iron and steel works as given in the *Directory* of 1904, compared with the figures in the present edition. The capacities are in gross tons:

	November, 1907.	June, 1904.
Number of completed blast furnaces (338 coke, 60 anthracite and coke, 50 charcoal).....	448	428
Electric plants (pig iron, ferrosilicon, &c.).....	7	2
Blast furnaces building and rebuilding..	28	17
Capacity of completed blast furnaces....	34,833,900	28,114,000
Capacity of charcoal furnaces (Included above)	760,000	851,600
Completed rolling mills and steel works..	598	572
Building and rebuilding rolling mills and steel works.....	15	13
Single puddling furnaces (a double furnace counting as two).....	2,635	3,161
Heating furnaces.....	3,971	3,995
Capacity in finished products of completed rolling mills, double turn.....	31,599,930	25,978,050
Cut nail works connected with rolling mills	20	23
Cut nail machines in these works.....	1,765	2,302
Completed standard Bessemer steel works	30	32
Completed standard Bessemer steel converters	71	75
Capacity of standard Bessemer steel converters (built and building) in ingots and direct castings.....	14,818,000	13,551,000
Completed Tropenas steel works.....	20	10
Completed Tropenas converters.....	29	14
Completed Robert-Bessemer steel works..	2	2
Completed Robert-Bessemer converters..	3	3
Completed Clapp-Griffiths, Bookwalter, Wills, Zenzen and other special Bessemer steel works.....	18	7
Completed special Bessemer converters..	28	11
Capacity of all kinds of Bessemer converters (built or building) in ingots and castings.....	15,020,200	13,628,600
Completed open hearth steel works.....	159	135
Open hearth steel works building.....	13	5
Open hearth steel furnaces (691 completed, 97 building and 3 partly built)	791	577
Capacity of these furnaces in ingots and castings	18,824,900	11,335,100
Crucible steel works (including two now building)	79	57
Steel melting pots in crucible steel works	4,573	3,606
Capacity of these pots in ingots and castings	295,385	226,610
Tin plate and terne plate works (two building in 1904).....	43	55
Forges making iron blooms, &c., direct from ore.....	1
Capacity in blooms, double turn.....	6,000
Pig and scrap bloomaries which make iron blooms, billets, &c., for sale (one building in 1904).....	11	9
Capacity of above in blooms, double turn..	64,200	41,300

Trade Publications.

Switches and Frogs.—Indianapolis Switch & Frog Company, Springfield, Ohio. Catalogue. Size 9 x 12 in.; pages 84. Cloth binding. Deals with switches and frogs and elaborates switching systems adaptable for railroads, street railroads and industrial railroads.

Ventilating Apparatus.—Warren Webster & Co., Camden, N. J. Folder. Describes the Webster air washer and humidifier, for cleaning and moistening the air supplies for heating and ventilating systems. It enables the air inlet to the fan to be connected to any convenient opening or window at the ground level, obviating the necessity of carrying air shafts to the roof.

Valves and Fittings.—Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa. Catalogue No. 10. 5½ x 8 in.; 56 pages. Illustrates cushioned nonreturn valves, emergency check and hand stop valves, pressure reducing valves,

Clean Seat valves, tilting steam traps, and controlling altitude valves which maintain a uniform quantity of water in steam pipes, reservoirs and tanks.

Recording Gauges.—Ashcroft Mfg. Company, New York. Circular. Illustrates and describes the Edson pressure recording gauge for recording steam, air, gas, water, ammonia and all fluid pressures.

Iron Castings.—Maher & Flockhart, 60 Polk street, Newark, N. J. Catalogue. Shows examples of work done, including various designs of sewer and park castings, which are a specialty in addition to the regular line of light and heavy machinery castings.

Corliss Engines.—Murray Iron Works Company, Burlington, Iowa. Pamphlet, Series D, No. 7. Entitled "Nomenclature of Murray Corliss Engines." Illustrates standard engines by half-tones and particularly complete line drawings, with the name of each part designated.

Mining Machinery.—The Christman Company, Massillon, Ohio. Catalogue. 6 x 9 in.; 100 pages. Contains illustrations of a number of the company's oil, gas and water well drilling machines, tools and accessories, mine cars, conveying apparatus and mining supplies.

Upright Drills.—J. E. Snyder & Son, Worcester, Mass. Catalogue; 6 x 9 in.; 51 pages. Illustrates various types and sizes of upright drills, ranging from 20 to 30 in., showing standard drills with tapping attachments, automatic stop, power feed, back gears and motor drives, separately and in combination. Also illustrates the Currier reaming machine described in *The Iron Age*, December 26, 1907.

Water Tube Boilers.—Franklin Boiler Works Company, Troy, N. Y. Catalogue; 7 x 10 in.; 32 pages. Briefly describes the Franklin boiler, showing longitudinal sections and contains interesting information, such as how to ascertain the space necessary for installing Franklin boilers of a given horsepower, and illustrates methods of installing boilers in partly constructed plants.

Heavy Milling Machines.—Ingersoll Milling Machine Company, Rockford, Ill. Catalogue No. 16; 6 x 9 in.; 64 pages. Illustrates various types of heavy milling machines with from one to four spindles in sizes from 20 in. wide up to 10 ft. wide, suitable for all kinds of very light to very heavy milling. The catalogue is mostly pictorial, giving over 50 illustrations, and only brief descriptions of each different machine.

Motors and Generators.—Mechanical Appliance Company, Milwaukee, Wis. Bulletins. No. 60 describes very completely the Watson multipolar motor and generators, and No. 61 is an album of motor applications to various types of machinery, including machine tools, ventilating fans, vacuum cleaning pumps, laundry machinery, linotypes, &c.

Gas, Gasoline and Alcohol Engines.—Dean Gas Engine & Foundry Company, Newport, Ky. Catalogue No. 7; 6 x 9 in.; 40 pages. Describes Dean engines suitable for operating on gas, gasoline or alcohol, and made in 5, 8, 15, 25 and 35 hp. sizes. This book is novel in that it contains a series of questions which have been asked from time to time by prospective consumers, with answers made by the company, and these questions cover nearly every important point that comes up in the purchase of a gas engine. A point is also made of giving the cylinder sizes as evidence that the engines are not overrated in their power capacity.

Portable Engines and Sawmills.—Enterprise Mfg. Company, Columbiana, Ohio. Catalogue. Shows different sizes of portable engines, with tabulated specifications, and sawmills, also gives directions and advice as to setting up and operating mills.

Automatic Engines.—Enterprise Mfg. Company, Columbiana, Ohio. Pamphlet. Illustrates standard types of automatic engines and contains tabulated specifications of engines of from 25 to 225 hp. capacity.

Electric Pyrometers.—William H. Bristol, 45 Vesey street, New York. Catalogue No. 20, including bulletins 20 to 24. Describes electric pyrometers for blast furnaces used for indicating and recording hot blast and top gas temperatures. Illustrations show various recording instruments made by the company and specimen records, scales and charts. The bulletins are devoted to testing equipments for laboratory use.

Steel Split Pulleys.—Pennsylvania Pulley Company, Pittsburgh, Pa. Folder. Treats of steel split pulleys from 12 to 60 in. in diameter and contains price-list and a few illustrations of larger sizes.

Culverts.—Isham Miller Company, Butternut, Mich. Booklet. Devoted to the company's line of cast iron expanding culverts, which are made in sections, with expansion joints, the sides being locked to the bottom with angle points, leaving the culvert free to expand at the top, which is protected with a cap to exclude rubbish and small stones.

Chain Hoists.—Reading Chain Block Company, Reading, Pa. Folder. Describes multiple gear chain hoists and illustrates various sizes.

New Low Cost Copper Mines.

The Boston *News Bureau* believes that a new era in copper is at hand, and makes the following statement regarding current developments in copper production:

It was only five years ago that it was discovered that the big porphyry deposits in the Bingham-Utah camp, for years regarded as waste rock, could be treated at a commercial profit and an average of 25 lb. of copper per ton of rock recovered, and now the Utah Copper Company, controlling this vast deposit, is turning out nearly 4,000,000 lb. of copper per month, and should soon be outputting 5,000,000 lb., enlarging its plant to a capacity even greater than the latter figure. About three years ago the big porphyry deposits of Ely, Nev., were discovered, since which time the Nevada Consolidated Copper Company and the Cumberland-Ely Company (both controlled by the Guggenheims) owning these deposits, have expended \$15,000,000 in preparation for mining. Production should commence within a comparatively few weeks.

Four Cents Below Last Year's Average Cost.

These big deposits in Bingham and Ely have been the only large sources of new copper supply discovered in the past five years, and their development has been watched with great interest by the mining world. It opens a new era in copper, for it means an enormous production at a figure about 4 cents per pound lower than the average cost of a majority of the producing mines last year. A minimum cost is, of course, the aim of all the mining companies, yet with the old producers, especially at Lake Superior and in Butte, as depth has been attained costs have been creeping upward, until in many instances they are now as high as 12 cents per pound. It stands to reason that in times of restricted consumption and necessity for low costs the deep mines of Butte and Lake Superior, which, combined, have been contributing well over 500,000,000 lb. of copper per annum, are at some disadvantage in comparison with the low cost producers in Ely and Bingham.

One of the leading interests in the Bingham and Ely properties figures out that these three Guggenheim properties within two years will be producing at the rate of 300,000,000 lb. of copper per annum, for it is not a question of ore, but of the building of reduction works. Rarely, if ever, in the history of copper mining have there been plans of such magnitude as those prepared by the Guggenheim engineers, which, if carried out, will result in the smelting end of the Guggenheim business being made subservient to the mining end.

By the fall of 1908 the Utah Copper, Nevada Consolidated and Cumberland-Ely companies should be producing copper at the rate of 110,000,000 to 120,000,000 lb. per annum, and this copper will come on the market no matter at what price the metal is selling. The Utah Copper Company is now handling 6000 tons of ore per day, and producing copper at the rate of over 40,000,000 lb. per annum, and yet only nine sections out of 12 in its 6000-ton concentrator at Garfield are in operation.

The Ely Companies Soon to Be Producing.

As the success of the Utah Copper Company seems assured, attention is diverted somewhat to the Ely companies, which are fast approaching the producing stage. The big Steptoe Valley reduction works, owned jointly by the Cumberland-Ely and Nevada Consolidated companies, should go into commission the early part of May, when the first section of the concentrator will start up and treat 1350 tons of ore per day. By July the entire present concentrator capacity of 4000 tons should be in operation, and also the 2000-ton smelter, and the indications are that the capacity of these works will be doubled during the coming year.

The Nevada Consolidated has already blocked out in its 850 acres 14,450,000 tons of ore, which will average 40 lb. of copper to the ton. Churn drills have also proved up wholly or partially many million additional tons. The Cumberland-Ely Company, with its 498 acres, has not been developed to the same stage as the Nevada Consolidated. Its principal work has been upon what is known as the Veteran claims, but this development of but

a year has brought into sight about 4,000,000 tons of ore, of which 1,800,000 tons have been blocked out on three sides, the average assay of the entire ore body showing a possible recovery of between 50 and 60 lb. of copper to the ton.

Both these companies are now prepared to furnish 2000 tons of ore per day to the Steptoe plant, and when the works are in position to take such a tonnage, some time in July, the Cumberland-Ely should be producing copper at the rate of 30,000,000 lb. per annum and the Nevada Consolidated from 20,000,000 to 25,000,000 lb.

A Profitable Ely Railroad.

The Nevada Consolidated and Cumberland-Ely own jointly the Nevada Northern Railroad. Earnings from this railroad and profits from the treatment of custom ores are expected to return the companies net profits of \$1,750,000 per annum, independent of the price of copper. This sum would be equal to 75 cents per share for the Cumberland-Ely Company, with its 1,300,000 shares, and 50 cents per share for the Nevada Consolidated Company, with its 1,600,000 shares (assuming the conversion of the recent issue of \$3,000,000 of bonds into 300,000 shares of stock). It is planned eventually to extend the railroad to Goldfield, which extension would add materially to earnings.

The campaign of development which has been pursued by the Utah Copper Company in Bingham and the Cumberland-Ely and Nevada Consolidated companies in Ely has been on a tremendous scale. Steam shovels and four compartment shafts are contributing factors in putting these companies in position to place millions of pounds of new copper production on the market at a cost of 8 cents per pound.

Mexican Chambers of Commerce.

The Mexican Government is about to take a radical and paternalistic step in the direction of promoting commerce and industry, by assisting local business men in the most important cities in the formation of chambers of commerce, whose functions will be of a varied and somewhat complicated character. The members will act in a co-operative way with the Department of Finance, which will decide as to the number of the members forming the local associations according to conditions in each locality. The chambers are to be known as *Camaras Nacionales de Comercio*. Their efforts will be directed as follows:

- To promote and direct commercial exhibitions.
 - To establish, either under their own or the Government's auspices, commercial museums in and out of the country.
 - To establish and maintain commercial relations with the other chambers of commerce at home and abroad.
 - To promote the celebration of conferences at which all the different chambers will be represented.
 - To act as arbitration courts to decide on litigations among merchants which may be submitted to them.
 - To give their friendly mediation in cases of trouble among employers and employees.
 - To execute liquidations in an unofficial way.
 - To promote commercial, industrial and maritime education, providing lectures, publishing studies, granting prizes to the best works on commerce and transportation; giving subsidies to students and sending them on instruction trips.
 - To issue periodicals containing all the local and foreign information which may be of interest to the merchants, and especially all the regulations, orders, &c., issued by the Federal and local governments.
 - To form, at the beginning of each year, a list of experts, who will be selected by judges, to report on commercial affairs.
 - To organize information bureaus in order to give the merchants all the information obtainable on commercial affairs.
- The idea originated with the resourceful Minister of Finance, José Y. Limantour, who believes that by the method indicated, the commerce of the country can be greatly increased, and many obstacles which at present exist can be overcome.

The Railroad & Car Material Company, 802 Bessemer Building, Pittsburgh, has been appointed general sales agent for E. R. Caldwell & Co., Bradford, Pa., manufacturers of brake shoes and gray iron castings, and has also secured the agency for the Timm's patent dust guard, manufactured by the American Dust Guard Company, Columbus, Ohio.

Traffic Clubs.*

BY W. B. EVEREST.

A little more than six years ago the Traffic Club of Pittsburgh was organized. Its charter members were imbued with the spirit of co-operation, which was before that time abroad among the local traffic representatives of the carriers and the shippers. The object of the club, as briefly stated in its by-laws, is "to promote good fellowship among its members and close relationship between the steam transportation and industrial organizations in the Pittsburgh District." Adhering strictly to this principle we have not taken issue with any questions which have disturbed the business of the country. We have rather given our first thought to home culture, and, like the home missionary, we seek to do first the work found waiting at our doors.

The Industrial Traffic Man Works Directly with the Railroads.

While thus avoiding aggressive work on the outside, the marked individual interest of each member in the success of the club and its principles has won for us a place in our own community of which we may be justly proud. It is a notable fact that while others are employing counsel or seeking aid through trade organizations, placing their grievances in the hands of special committees, appealing to the Interstate Commerce Commission, or through State commissions, the Pittsburgh traffic man usually adjusts his troubles at home by confidential discussion as between man and man.

Without permanent quarters we claim the great Pittsburgh District as home. The club is not self-centered, but has been eager to discuss questions of live interest to the traffic world at large. The club councils and the family circle meetings have been looked upon as events always helpful to those in attendance. A marked fraternal spirit has pervaded the membership, and the hand offered in greeting is felt to have had the heart behind it. The furthering of the club's aims and principles has benefited and relieved distressed business conditions times without number. At our bimonthly meetings we have not turned to light entertainment, but have been instructed and directed by men of prominence, who have addressed us on many topics touching our daily business lives. In all this we have sought and feel assured of the approbation of our superior officers, who are favoring us with their presence here to-night.

It has been recognized more and more that direct representation in traffic matters on the part of the shippers is quite as necessary as commercial representation by the railroads. No shipper handling a traffic of any magnitude can regulate the many difficulties arising outside the horizon of the local line agent without the assistance of the commercial representative or the traffic officials, who may find it necessary to make a ruling which, in the eyes of the line agent, would appear to be a violent fracture of what is to him as the laws of the Medes and Persians, because he works only by the book, which instructs him to receive, forward and deliver under fixed rules or conditions.

Co-operation Work Through Traffic Clubs.

There are registered in accessible form to all interested the names and connections of over 3000 industrial traffic managers throughout this country. Many of the railroad and industrial representatives are to-day enjoying the benefits and aiming at co-operative work through traffic clubs, which have been formed in other cities following the same lines of organization and declaring for like principles and purposes as the Pittsburgh Club, the first in the field. In New York, Chicago, St. Louis, Cleveland, St. Paul, Toledo, Kansas City and Philadelphia the traffic club spirit we confidently expect will accomplish the same results as in Pittsburgh, and we count it a special pleasure to welcome any of those among our guests who have come to us from those other clubs, and

beg that you will take home with you from Pittsburgh a message of good fellowship.

We believe traffic clubs are institutions created out of the necessities of the times, and their description and plan of procedure might be likened to a railroad system:

The line along which they travel, the national highway of mutual interests;

The roadbed founded on the commerce clause of the Constitution of the United States, and

The right-of-way hemmed in by guard rails of the Cullom-Hepburn-Elkins and Sherman pattern.

The two main terminals are freedom of commerce and commercial expansion. The vehicle is co-operation, and the operators are the carriers and the shippers, who should each ask the other—Is there anything we have failed to do that we should have done? What is our duty? Have we done anything that we should not have done, or what is it that in justice and reasonableness to both sides is yet required?

We have always before us many problems for mutual consideration, among which are the following:

- Proper methods of marking and packing.
- Uniform car service rules under like conditions.
- Proper station facilities.
- Sufficient terminal service.
- Reasonable rules and regulations.
- A clearing house for overcharge claims.
- Water and canal competition.
- Preparation for future expansion.
- Uniform bill of lading.
- Instrumentalities of transportation.

We of the Pittsburgh Traffic Club realize that men and things are usually in the end estimated at their true value. We know that any factor in the world's work is measured by the principle and purpose at its center. We stand firmly on the doctrine of co-operation between carriers and shippers, and believe it to be essential to commercial peace and progress.

Our work here will continue, not only in spirit, but in action, along the lines of co-operative team work. We confidently hope that, added to the group of clubs throughout the country, other traffic clubs will rise and shine, each a particular star in the firmament of our world of industry and transportation. When all our ambitions and aspirations belong to the past, when the fulfillment of all things is accomplished, when the last pages of the book of time are reached and the tale of man's little moment of flickering activities shall culminate in that history recording all our deeds, after the place is reached showing the sum total of all our successes and all our failures, no brighter page will be found than that recording the lives of those who have in their relations to others always practiced unselfish co-operation.

The A. S. M. E. Papers.

A partial list of the papers to be presented at the semiannual meeting of the American Society of Mechanical Engineers in Detroit, Mich., June 23 to 26, has been announced. It includes "A Method of Cleaning Gas Conduits," by W. D. Mount; "A Method of Checking Conical Pistons for Stress," by Prof. George H. Shepard; "Clutches, With Special Reference to Automobile Clutches," by H. Souther; "Horsepower, Friction Losses, and Efficiencies of Gas and Oil Engines," by Prof. L. S. Marks; "Some Pitot Tube Studies," by Prof. W. D. Gregory; "The Thermal Properties of Superheated Steam," by Prof. R. C. H. Heck; "A Journal Friction Measuring Machine," by Henry Hess; "A By-Product Coke Oven," by W. H. Blauvelt, and "Tests of Some High Speed Steam Engines," by F. W. Dean. As has already been stated, there will also be a symposium on conveying machinery. The Society for the Promotion of Engineering Education and the Society of Automobile Engineers will hold their annual meetings in Detroit at this time.

The Wheeler Condenser & Engineering Company, Carteret, N. J., has arranged with Charles S. Lewis & Co., Granite Building, Fourth and Market streets, St. Louis, Mo., to handle its products in the State of Missouri.

* Extract from an address before the Traffic Club of Pittsburgh, April 3. Mr. Everest, who is traffic manager of the Westinghouse Electric & Mfg. Company, is president of the club.

The Ore Trade Still Quiet.

DULUTH, MINN., April 18, 1908.—The lakes are free from ice, and the season is unusually advanced for the Northwest. Package freight ships will be moving from both ends of the lakes in a week, as soon as insurance is on, but there is still no move toward the ore trade. No outfitting has begun anywhere for ore vessels. As far as can be ascertained here there are no inquiries for ore, no sales and no tonnage contracts for any ports. The cities near iron mining districts are filling up with mining men, engineers and superintendents, chiefly from independent companies, who are out of work, their mines having been closed. The Oliver Iron Mining Company is retaining most of its engineers and superintendents and is carrying on the customary amount of preparation, but few others are doing any work that it is not necessary.

Curtailment on the Menominee.

In the Stambaugh District of the Menominee Range there has been a severe curtailment of operations the past week. The mines to close include four properties of Oglebay, Norton & Co.—the Chatham Nos. 1 and 2, the Berkshire and the Lenox—as well as the Youngs, belonging to the Huron Mining Company. Other mines may close soon. These five reduce the operating force in the district by about 275 men. In the Crystal Falls District, close beside Stambaugh, the Corrigan, McKinney & Co. properties are running very slowly, and the Bristol will make a second and drastic curtailment this week. The Commonwealth and Traders will close soon. Neither of these has been doing much this winter.

At Norway the old Norway mine is closing down, but temporarily only, in order to give opportunity for the installation of the new electric pumping and hoisting system that the General Electric Company has been installing. While the mine is idle the married men working there will be employed at the properties of the same company nearby.

Mines of the Menominee Range which have not closed, and, so far as can be determined, do not expect to, will not resume shipments any earlier than those of the Mesaba—that is, about June 1 to 15. Indeed, this is true of all districts along Lake Superior.

Mine Improvements.

The Foundation Company, New York, which has been putting down a concrete reinforced shaft at the Smith mine of the Cleveland-Cliffs Company at Gwinn, is to sink two similar shafts for the same company in the same district. It is about 100 ft. to ledge where these will go down, and the surface is very wet and quick. These concrete shafts are costly, running from \$500 to \$750 a foot, but they are sure, and so far the Foundation Company has met with no failures in the Lake Superior region, though it has sunk three very difficult shafts to date.

Butler Bros. have commenced stripping the Virginia Oliver property, leased to M. A. Hanna & Co., and will take off about 1,000,000 yards. The contract will not be completed for some years. There is no great depth of overburden, but the mine is a fairly large one and covers considerable area. Tracks have already been laid to the property, which lies just northwest of the Oliver Company's Alpena, and the removal of dirt with one shovel will commence in a few days. On account of the configuration of the ground it will be impossible to use more than a single shovel for some time, and no shipments will be made this season. Aside from some of the work of the Oliver Company in stripping and development at its western Mesaba mines, this is the most important stripping operation under way on the range.

Diamond drill exploration is to begin once more, on what is supposed to be a western extension of the Vermillion Range, some 20 miles north from Hibbing, in T 60-20, and 21. There is no question that ore exists there, but to what extent and of what quality has not been satisfactorily determined. As far back as the year when State Geologist Winchell made a report on the Mesaba, in 1892, he noted the presence of low grade iron ore in these townships, and at various times since then explorations have been carried on there, always with no success. Some of these were well backed with funds, the

Great Northern Railroad having been one of the exploring syndicates.

While the Nassau mine of the Pittsburgh Iron Ore Company will not operate this year its La Rue will be operated heavily. A contract for stripping and mining on this property has recently been let to Butler Bros., and they are assembling materials for the work.

Water Difficulties in Some Mines.

It is stated that Pickands, Mather & Co. will attempt to enjoin certain head of the lake lumber interests from raising the water in flowage dams on the Embarras River, on account of the fact that this water backs up into the Bangor and Syracuse mines, and makes it impossible to operate them economically. It may be impossible for the mining company to secure an injunction if the lumber company has State laws or legislative rights for its dam, as is extremely probable. The lumber company had its dams there many years prior to the opening of these mines, and would be considered to have prior rights, if under the law. The fact remains that the operation of these mines is exceedingly precarious on account of the immense volume of water troubling the company, and it is evident that the water backs up into both mines through the heavy quicksands and boulders connecting them. It is impossible to pump out the river or the dam, when filled for the flowage of logs, and it is a serious problem for the mining company. The mining company has been making experiments tending to determine that the water that has bothered them comes directly from the lake formed by this dam, and claims to be amply assured of this point.

On account of the lack of work, especially for them, the various labor agitators of the Western Federation of Miners who have been on the Mesaba since the close of their last year's strike have about all left for greener pastures, and the range is at last free from any of their talk. This is one of the gains from a dull season.

The Oliver Iron Mining Company put a large force of men at work in its Blue mine at Negaunee this week, and will open extensively underground. The mine has been under repairs for some time, and will ship heavily when the season opens.

In regard to the possibility of a transfer of the Corrigan, McKinney & Co. mines to the Steel Corporation, it will be remembered that this was given in this correspondence as a mere rumor, and so distinctly stated. No direct statement that such a sale was made or was in contemplation was ever printed in *The Iron Age*.

D. E. W.

Moose Mountain to Have a Railroad.

TORONTO, April 18, 1908.—In the closing days of the session that has just ended, the Ontario Legislature passed an act authorizing the Government to give the guarantee of the province that the principal and interest of a 40-year 3½ per cent. bond issue of the Canadian Northern Ontario Railway Company will be paid. The total amount of the issue is to be \$2,500,000. The phase of the transaction that makes mention of it specially interesting is the fact that the Moose Mountain iron deposit is the objective of one of the short branches for whose construction the bond issue is to provide. The main line from Toronto to Sudbury was built with the proceeds of a bond issue guaranteed by the Ontario Government up to \$20,000 a mile. When the extension to Moose Mountain and Garson mines is completed the railroad will be in a position to ship ore to Toronto or any other point on its system. Since the money stringency began little has been heard as to the company's plans for building great iron and steel works in Ashbridge's Marsh, Toronto. Another point to which a short branch line, covered by this new bond issue, is to be extended is Key Inlet on Georgian Bay. At the company's terminus there ore might be loaded on vessels to be carried up or down the lakes, or it might be smelted in furnaces there, as has been suggested. In the Legislature the utility of the new branches for the developing of the iron ore deposits was strongly dwelt on by the Government.

C. A. C. J.

PERSONAL.

Walter H. Jenkins has been added to the sales force of the Youngstown Car Mfg. Company, Youngstown, Ohio, in charge of the Chicago office, rooms 934-935 Monadnock Building.

Dr. M. E. Wadsworth, dean of the school of mines and professor of mining and geology in the Pennsylvania State College, was elected last year dean of the school of mines and professor of mining geology in the Western University of Pennsylvania. The call was accepted with the understanding that he was to hold both positions and to discharge the necessary duties of both until September 15, 1908, when he would take up his permanent residence in Pittsburgh. This was done so as to give the authorities of the Pennsylvania State College sufficient time to select a suitable successor. The Western University having purchased a new site near the Hotel Schenly, Carnegie Institute, and the Technical Schools, Dr. Wadsworth has completely reorganized the school of mines, and prepared plans for the new \$175,000 mining building, which is to be erected next summer.

Alfred Sang, vice-president of the Garland Nut & Rivet Company, Pittsburgh, Pa., is making a tour of England and France. Mr. Sang is the inventor of a galvanizing process.

Dr. Charles S. Howe, president of Case School of Applied Science, has been elected president of the Chamber of Commerce, Cleveland.

Archibald Johnston, president of the Bethlehem Steel Company, is expected back from Europe this week.

W. J. Culletin, superintendent of the Broad Ford Valley plants of the H. C. Frick Coke Company, has been appointed superintendent of the company's new Phillips plant, which is now nearly complete.

H. B. McMasters has resigned his position as secretary of the General Fireproofing Company, Youngstown, Ohio, effective May 1.

E. E. France has resigned as treasurer of the Seneca Chain Company, Kent, Ohio. M. G. Garrison will act as treasurer until the annual meeting.

P. N. Guthrie, Jr., has been appointed general sales manager of the Longmead Iron Company, Drexel Building, Philadelphia, whose tube works are at Conshohocken, Pa. He has heretofore been Pittsburgh representative of the company.

The class day address to the class of 1908 of the Michigan College of Mines, Houghton, Mich., will be delivered Friday, May 1, at the college gymnasium by Dr. Charles Richard Van Hise, president of the University of Wisconsin. The class dinner will take place the following evening.

Herbert J. Burrough of the Builders' Iron Foundry, Providence, R. I., has returned from a three months' European trip.

Eliot A. Kebler, in addition to being manager of the Pittsburgh office of Matthew Addy & Co., Farmers' Bank Building, Pittsburgh, has been made manager of sales for that firm, with headquarters in Cincinnati.

David Halstead, treasurer of the Carver File Company, Philadelphia, sailed from New York, April 18, for a two months' trip abroad.

The Philadelphia Roll & Machine Company, Philadelphia, has appointed Charles R. Bryson its Western agent, for the sale of sand and chilled rolls, rolling mill equipment and charcoal iron air furnace castings, with headquarters at 501 Curry Building, Pittsburgh.

Rust Preventives.—In a communication to the *Engineering Record*, Dr. Allerton S. Cushman, assistant director, Office of Public Roads, Department of Agriculture, Washington, D. C., refers to the suggestion in his recent pamphlet on the corrosion of iron that slightly soluble chromates should be theoretically the best protectives to apply to iron and steel surfaces. It is found, however, that owing to included impurities many commercial chrome pigments stimulate rather than inhibit corrosion.

Zinc chromate and a pigment made by precipitating barium and calcium chromates give good results in the absence of impurities, and Prussian blue has been used effectively. Referring to the fact that patents have been applied for on a combination of zinc chromate with linseed oil as a coating for iron and steel, Mr. Cushman says that in view of the general publication of the results of his experiments he does not think such a patent would be justified, and adds that it would be a mistake, in case these inhibitive formulae prove of high protective value, to have their general use tied up by individual patent claims.

OBITUARY.

WILLIAM L. GROUT, Greenfield, Mass., for many years a prominent figure in the sewing machine industry, and for a long time head of the New Home Sewing Machine Company, Orange, Mass., died April 15. He was born in Winchendon, Mass., in 1833, and passed his early years on a farm. He started the manufacture of sewing machines at Templeton, Mass., in 1860, in company with Thomas White, founder of the great sewing machine business that bears his name. They did not remain together long, but both continued in the industry. Mr. Grout established a number of factories at different times. Shortly after the Philadelphia Centennial Exposition he purchased the Home sewing machine patents and in 1878 went to Orange and assumed charge of the business. The Grout Automobile Company, Orange, was named for him. He was noted as an inventor. He was twice married and leaves four sons and two daughters.

ANDREW H. MCNEAL, Burlington, N. J., who has been prominently identified with the manufacture of cast iron pipe for a number of years, died at his home in Ashbourne, Pa., April 17, aged 67 years. Mr. McNeal and his father operated the pipe works at Florence, N. J., which was later purchased by R. D. Wood & Co. He was for some years prominently connected with the United States Cast Iron Pipe & Foundry Company, Burlington, N. J., and later assisted in the formation of the Standard Cast Iron Pipe & Foundry Company, Bristol, Pa., with which he was connected at the time of his death. He leaves a widow and four daughters.

LESTER A. PELTON, inventor of the Pelton waterwheel, died at Oakland, Cal., March 15, aged 78 years. He built the first wheel to develop power for mining work in California.

A. L. BOUGHTON, secretary of the Standard Sand & Machine Company, Cleveland, Ohio, died April 12 of pneumonia, aged 37 years.

S. B. RAWSON, a prominent manufacturer of Elyria, Ohio, and president of the Dean Electric Company in that city, died April 9, aged 60 years.

MAJOR CHARLES D. RHODES, for the past two years, until last January, Cleveland sales agent of the Lackawanna Steel Company, died April 16 at a hospital in Sharon, Pa., aged 62 years. While in New York on January 22 last he suffered a stroke of apoplexy. When he had partially recovered from that attack he went to Sharon to live with a daughter.

The Pickands-Magee Company, Frick Building Annex, Pittsburgh, will add to its present list of coke operations a 40-oven plant, located on the Sewickley branch of the Pennsylvania Railroad. This plant adjoins the Mammoth and Calumet properties of the H. C. Frick Coke Company, in the old Connellsville basin. The company will operate it as the Magee Coke Company and will produce high grade foundry coke. Shipments will be commenced early in May.

*At the annual meeting of the Providence Branch of the National Metal Trades Association, Herbert J. Burrough, Builders' Iron Foundry, was elected president; Henry D. Sharpe, Brown & Sharpe Mfg. Company, vice-president, and John G. Aldrich, New England Butt Company, treasurer.

NEWS OF THE WORKS.

Iron and Steel.

The Knoxville Iron Company, Knoxville, Tenn., after being closed down during the dull spell, has resumed regular running.

Announcement is made by the management of the Fort Worth Iron & Steel Company, Fort Worth, Texas, that the entire force has been taken back and work resumed for at least three days of the week for the immediate future.

The Republic Iron & Steel Company banked its Hall Furnace in the Shenango Valley last week. It had been in blast since March 1, after an idleness of several months. The company's No. 1 Haselton furnace in the Mahoning Valley was banked last week. It now has in operation two Haselton furnaces and two pioneer furnaces at Thomas, Ala.

Furnace B of the Northwestern Iron Company, Mayville, Wis., has gone out of blast for repairs to the lining.

Furnace B of the Buffalo Union Furnace Company, and Dover Furnace of the Penn Iron & Coal Company, Canal Dover, Ohio, have recently been equipped with new blowing engines and condensers.

The furnace of the Sloss-Sheffield Steel & Iron Company, at Florence, Ala., has been blown out for relining.

The trustees of the Quinn Furnace Company, Gadsden, Ala., recently appointed by the Federal court, will operate the plant. Repairs have been commenced, and the furnace will probably be in operation within 90 days.

The Tidewater Steel Company's blast furnace at Chester, Pa., which the Pennsylvania Steel Company has been operating under lease since January, 1907, in the production of spiegel-eisen, was blown out April 17. The lease has expired, and the furnace property reverts to the receivers of the Tidewater Steel Company.

General Machinery.

A new plant is in course of construction at South Houston, a suburb of Houston, Texas, for the Tandem Gas Engine Company of that city, which has been incorporated with a capital of \$50,000, of which \$25,000 is paid in.

The Wilmington Iron Works, Wilmington, N. C., is in the market for a pulley molding machine and a machine for turning and boring pulleys.

Couch & Duff, Booneville, Ky., will place on the market the Little Giant well drilling machine, the invention of J. E. Couch. The parts of the machine will be made by contract by the Eagle Casting Company, Winchester, Ky., and will be assembled at Booneville.

The Coal-Briquette Machine Company, Oshkosh, Wis., has increased its capital stock from \$5000 to \$10,000. The company has developed a new briquette machine, which weighs 7 tons and has a rated capacity of 100 tons of briquettes in 24 hr. It is designed to exert a compressive force of 4000 lb. to the square inch. The machine is the invention of W. H. Wyman. The officers of the company are Leander Choate, president; W. J. Hay, vice-president; W. W. Waterhouse, secretary; R. C. Brown, Jr., treasurer.

The Canton Valve & Mfg. Company, Canton, Ohio, has been incorporated with a capitalization of \$10,000, by James L. Amerman and others.

Power Plant Equipment.

The Tofte Boiler & Sheet Iron Works, Houston, Texas, has been incorporated, with a capital stock of \$40,000, by H. H. Tofte, Frank Wilberg and W. E. Nicholson.

The Sherbrooke Power, Light & Heat Company, Sherbrooke, Que., Canada, whose plant is now operated by two 500-kw. 60-cycle generators, direct connected to water wheels of 875-hp. capacity each, expects within a few months to install another unit of the same kind and size. A. Sangster is superintendent of the company.

An issue of \$50,000 has been voted by the citizens of Ruston, La., to provide funds for making improvements and extensions to the light and water plant. J. S. Bond is Mayor.

Plans are being prepared by M. A. Earl & Co., Muskogee, Okla., for water works systems at Deshler, Neb., to cost about \$16,000; Hildreth, Neb., \$15,000, and Blomington, Neb., \$14,000. Figures will be taken on all of this work in the near future.

The town of Dixon, Tenn., has through the sale of bonds provided a fund of \$25,000 for the construction of a system of water works. Plans and specifications for this improvement have not yet been drawn, nor has any of the material been purchased.

The N. & S. Electric Company, Seattle, Wash., has been incorporated with a capital stock of \$24,000, the incorporators being Robert Wilhelm and Wilson Niedergaess.

A bond issue of \$42,000 has been authorized by the citizens of Concordia, Kan., for the purpose of making important improvements and extensions to its water works system. Plans include the purchase of about 4 miles of 6 to 12 in. water pipe, 25 or 30 fire hydrants, water gates, large service pump, 1,000,000

gal. capacity or over; one new boiler, and a stand pipe 25 to 35 ft. diameter, 75 to 100 ft. high. The erection of a large brick smokestack is also included in the proposed improvements. W. C. Whipp is Mayor.

Bids will be received until May 4 by the clerk of Milan, Mich., for constructing a water works system, including storage reservoir complete, elevated steel tank, power house and power equipment, about 25,000 ft. of cast iron pipe, valves, hydrants, &c.

The Parker Boiler Company, Philadelphia, Pa., has recently completed installations of two 198-hp. boilers for the George Zeigler Company, Milwaukee, Wis.; 202-hp. boiler, Walter Brewing Company, Pueblo, Colo.; two 411-hp. boilers, Colorado Ice & Cold Storage Company, Denver, Colo.

Foundries.

The Pratt & Letchworth Company, Buffalo, N. Y., is erecting a modern pattern shop, 60 x 150 ft., of iron, brick and cement, making it practically fireproof. The company is also erecting a fireproof vault for the storage of patterns.

The Central Foundry & Mfg. Company, Collinsville, Ala., is erecting a building, 50 x 150 ft., for the manufacture of wagons, plows, sad irons, grates, &c. In addition a general foundry business will be conducted. The shop will be ready for operation in about 60 days. The greater portion of the equipment has been secured.

The Union Steel Casting Company, Pittsburgh, is making some large additions to its plant, including the erection of an extension, 45 x 180 ft., to its finishing shop, and a new pattern and storage building, doubling the capacity of this department. Extensive changes are being made in the power plant, including the installation of a compressor to supply power for air tools throughout the plant; and two 140-hp. gas engines will be included in the new installation. A special planer for machining the heads of locomotive frames will soon be placed in position. A 10-ton electric crane will serve the new finishing shop. The cost of the new improvements will be between \$50,000 and \$60,000.

Bridges and Buildings.

The Southern Structural Steel Company, San Antonio, Texas, has been organized with a capital stock of \$100,000 for the purpose of manufacturing structural steel and iron. The incorporators are B. F. Youngblood, G. L. Youngblood and W. M. Cornett.

Fires.

The plant of the Pembroke Light & Power Company, Pembroke, Maine, was damaged \$10,000 by fire, April 11.

The pumping station of the water works at Newport, Ky., was burned April 12, the loss being about \$12,000.

The edge tool factory of the Whitman & Barnes Mfg. Company at St. Catharines, Ont., was badly damaged by fire April 16.

The foundry of the Washburn Steel Casting & Coupler Company, Minneapolis, Minn., was damaged \$6000 by fire, April 15.

Miscellaneous.

The Comee Metallic Packing Company, Stevens Point, Wis., recently organized for the manufacture of metallic packings especially adapted for service on railroad locomotives, has been incorporated with a capital stock of \$50,000. The officers are C. H. Curtis, president, and J. F. Comee, vice-president and general manager.

The freight car repair department of the Atlantic Coast Line Railroad at Wyncross, Ga., has opened up its new shops with 100 men. Tools and material are being rapidly transferred, and it is regarded as probable that the entire shops will be open in a few days, when 2000 men will be employed in all departments.

The firm of Oltmans Schmidt & Co., Peoria, Ill., iron and wire workers, has been incorporated with a capital stock of \$7500. The incorporators are Herman Oltmans, Charles J. Schmidt, Antonio F. Voelker.

A contract has been let by the Portland Gas Company, Portland, Ore., for the construction of a 13,000-bbl. oil tank.

The H. H. Clough Company, Elyria, Ohio, has incorporated with a capital stock of \$1,000,000 to manufacture concrete specialties under patents of H. H. Clough. The company will erect a plant at Amherst, Ohio, for which a 150-ton hydraulic press has been purchased for making the steel molds in which the concrete is formed. A feature of the business will be the manufacture of the specialties on a series of railroad cars at the place for which the product is required.

R. G. Wright & Co., manufacturers of dairy machinery, Buffalo, N. Y., will erect a five-story factory and warehouse at Eagle and Oak streets, and equip it for an increased output of their products.

We are advised that the report that the Youngstown Car Mfg. Company, Youngstown, Ohio, had received a contract for 40 coal cars for the United States Naval Coal Depot, California City Point, is untrue.

The McKinnon Iron Works Company, Ashtabula, Ohio, of which State Treasurer W. S. McKinnon is president, has been reorganized and reincorporated with a capitalization of \$150,000. H. A. McKinnon is vice-president, secretary, treasurer and general manager.

The Iron and Metal Trades

There has been no improvement in the Iron industry, and the feeling of discouragement is spreading. In those branches in which the majority of manufacturers are acting in harmony, the reports of moderate concessions are being received with indifference since there is really not enough doing to test the markets seriously. Manufacturers point to the fact that in the lines in which there is an open market, for instance, in Bolts and Nuts and in Shafting, the low prices are not stimulating business, and that therefore nothing is to be gained as yet by any revision of prices.

At the fairly attended meeting of the Foundry Iron makers of the three leading districts last week a somewhat radical course was at first adopted, but on reconsideration the action proposed was kept in abeyance for two weeks, and former prices were reaffirmed. The ranks were kept intact, but there were no accessions, particularly from the South, which are most important. For the present, therefore, the associated furnaces are in the same position as before, accumulating the greater part of their much reduced make, while the outsiders are taking what little business is being done.

In the Central West and in the South the markets are a little weaker, with Iron available on the basis of \$15, at furnace, for No. 2 in the Central West, and of \$11.50 in Birmingham.

For the Chicago street roads there have been placed orders for 8000 tons of Girder Rails and 500 tons of Guard Rails, while Pittsburgh reports a lot of 2200 tons for export. Steel Billets are being offered by merchants at a concession of about \$1 per ton, without tempting consumers.

The Plate trade is exceedingly dull, the only transaction of interest being the sale by an Eastern mill of a lot of 2000 tons, for export to Newfoundland. The same enterprise will take 1500 tons of Structural Material. The Chicago & Northwestern road has distributed one order for 600 50-ton Ore cars, and the Northern Pacific has placed 500 refrigerator cars. An important tonnage of material which is coming up is the 20,000 tons of Steel Plates which will be needed for the Steel Pipe extension of the Brooklyn water works. Two bridges, calling for 1500 tons, have been given out to an Eastern Steel works by the Lehigh & New England road. Among the structural work coming up is some tonnage for the Staten Island ferry terminal and 3500 tons for the American Tobacco Company in Chicago.

The Eastern Bar Iron manufacturers have reaffirmed prices on the basis of 1.65c., Philadelphia, but merchants and jobbers are taking what orders there are at about 1.40c.

The Tin Plate industry continues the most active of all. It is estimated that the leading interests have 85 per cent. and the independent mills 75 per cent. of the capacity in operation. The Merchant Pipe trade is somewhat better.

The Copper market is quite steady, with Electrolytic at 12.75c.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

Apr. 22, Apr. 15, Mar. 25, Apr. 24,
1908. 1908. 1908. 1907.

PIG IRON, Per Gross Ton:

Foundry No. 2, Standard, Philadelphia	\$17.50	\$17.75	\$17.75	\$24.50
Foundry No. 2, Southern, Cincinnati	15.25	15.25	15.25	24.75
Foundry No. 2, Local, Chicago	17.35	17.35	17.50	26.00
Bessemer, Pittsburgh	17.25	17.65	17.75	23.85
Gray Forge, Pittsburgh	15.40	15.40	15.90	21.85
Lake Superior Charcoal, Chicago	20.00	20.50	20.50	26.50

BILLETS, &c., Per Gross Ton:

Bessemer Billets, Pittsburgh	28.00	28.00	28.00	30.50
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila.	29.20	29.20	29.20	32.00
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton:

Steel Rails, Melting, Chicago	12.00	12.00	12.00	18.00
Steel Rails, Melting, Phila.	12.75	12.75	12.75	19.00
Iron Rails, Chicago	15.00	15.00	15.00	24.50
Iron Rails, Philadelphia	17.00	17.00	17.00	27.00
Car Wheels, Chicago	13.50	13.00	15.50	25.00
Car Wheels, Philadelphia	14.00	14.00	14.00	24.00
Heavy Steel Scrap, Pittsburgh	12.75	12.75	13.00	17.75
Heavy Steel Scrap, Chicago	11.00	11.00	11.25	15.50
Heavy Steel Scrap, Phila.	12.75	12.75	12.75	18.75

FINISHED IRON AND STEEL,

Per Pound:

	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.50	1.50	1.65	1.83½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.76½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.55	1.70	1.70	1.85
Skelp, Sheared Steel, Pittsburgh	1.65	1.80	1.80	1.90

SHEETS, NAILS AND WIRE,

Per Pound:

	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	1.90	1.90	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45

METALS, Per Pound:

	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	13.00	13.00	13.25	25.00
Electrolytic Copper, New York	12.75	12.75	13.25	24.00
Spelter, New York	4.65	4.65	4.75	6.75
Spelter, St. Louis	4.50	4.50	4.55	6.60
Lead, New York	4.00	4.00	4.00	6.10
Lead, St. Louis	3.85	3.85	3.85	5.95
Tin, New York	31.70	32.00	32.25	42.00
Antimony, Hallett, New York	8.75	8.75	9.50	22.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	\$3.89	\$3.89	\$3.89	\$4.09

Chicago.

FISHER BUILDING, April 22, 1908.—(By Telegraph.)

The Iron and Steel mills of this district, outside of those engaged on Wire products, are less active than at any time in the past two months. At the South Works of the Illinois Steel Company all finishing mills are down except the No. 1 Rail mill. None of the mills of the Bayview plant is running but the demand for Nails and Wire is furnishing enough tonnage to keep the works at Joliet in operation at fair capacity. Now that old contracts in heavier materials are practically completed, mill schedules are almost wholly dependent upon new business, and because of its slow development uninterrupted operation is impossible even at part capacity. Steel Bar mills are started at intervals of a week or two when enough specifications have been secured to run for a few days. The only one of the local group in commission this week is the Moline mill of the Republic Iron & Steel Company. The demand for Iron Bars is relatively stronger, though by no means of satisfactory volume. Only a small part of the Structural tonnage on which awards of fabricating contracts were expected was closed last week. At the same time it is believed that most of the building projects on which bids have been tendered will be put through before long. No further purchases of considerable Rail tonnage by steam roads are reported, but an order for 8000 tons of Girder Section Rails and 500 tons of Guard Rails has been placed by the Chicago Railways Company with the Lorain Steel Company. There has been some falling off in Sheets and recent developments indicate that

prices are not being maintained. With jobbers reducing stocks and nothing doing in the Plate using industries, the demand for Plates is extremely dull. An order placed by the Chicago & Northwestern for 600 all Steel Ore cars of 100,000 lb. capacity has been divided between the Pullman Company and the American Car & Foundry Company and in addition to this the latter company has secured an order for 500 refrigerator cars from the Northern Pacific. The only item in Scrap for which there is any demand is re-rolling Steel Rails. Some recent purchases made and others in contemplation have resulted in a slight firming up of prices. The Pig Iron situation is unchanged save that Southern Iron is somewhat weaker. There is not enough tonnage being offered to test the market, but for No. 2 Foundry as low as \$11.50, Birmingham, has been done.

Pig Iron.—The few inquiries coming into the market continue to be for small lots for immediate shipment. Some sales of this character ranging from car lots up to 500 tons have been made during the week, but in the aggregate the amount of tonnage being moved serves only to emphasize the scant requirements of consumers. Purchases made by melters in almost every case represent specific tonnage required to cover casting contracts that have been secured. Both the furnacemen and consumers are watching the progress of negotiations in the furtherance of proposed plans for holding Pig Iron against the effects of demoralizing competition. Producers, while agreeing that the accomplishment of the object aimed at in this movement is highly desirable, do not hesitate to express their serious doubt of its success. Instead of showing greater firmness prices have developed a weaker tendency as is evidenced by recent sales made on a basis of \$11.50, Birmingham, for No. 2 Foundry. It is not believed that any large amount has changed hands at this figure, but the fact that it has been made on comparatively small lots leaves it an open question as to what might be done on a round tonnage offer. None of the furnaces shows any inclination to contract for second half business at present prices, and as consumers interpret market conditions they find nothing in them to indicate the advisability of anticipating their wants beyond the present quarter. Under such circumstances the demand is naturally limited to what is needed for current consumption. With a spread of \$1 or more a ton which now exists between Northern and Southern Irons, only such lots of the former are being sold as are required for specific use that will not admit of substitution. While continuing this week to quote Southern Iron on a basis of \$12, Birmingham, it is fair to say that the spread of 50c. above this price in the outside column is purely nominal. The principal producers are holding at \$12 flat, and whatever variations there may be are below rather than above this price. The following prices are for April, May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal.....	\$20.00 to \$20.50
Northern Coke Foundry, No. 1.....	17.85 to 18.35
Northern Coke Foundry, No. 2.....	17.35 to 17.85
Northern Coke Foundry, No. 3.....	16.85 to 17.35
Northern Scotch, No. 1.....	18.35 to 18.85
Southern Coke, No. 1.....	16.85 to 17.35
Southern Coke, No. 2.....	16.35 to 16.85
Southern Coke, No. 3.....	15.85 to 16.35
Southern Coke, No. 4.....	15.35 to 15.85
Southern Coke, No. 1 Soft.....	16.85 to 17.35
Southern Coke, No. 2 Soft.....	16.35 to 16.85
Southern Gray Forge.....	14.35 to 14.85
Southern Mottled.....	14.10 to 14.60
Maleable Bessemer.....	17.50 to 18.00
Standard Bessemer.....	19.50 to 19.65
Jackson Co. and Kentucky Silvery, 6 %	17.90 to 18.40
Jackson Co. and Kentucky Silvery, 8 %	19.90 to 20.40
Jackson Co. and Kentucky Silvery, 10 %	21.90 to 22.40

(By Mail.)

Billets and Rods.—There is practically no business in the market, nor are there any inquiries that indicate either positive or passive interest on part of consumers. Prices, however, are seemingly unaffected by the lack of movement, and are reported to be firm and unchanged. We quote Forging Billets at \$31.50 to \$32.50, Chicago. Owing to the continuance of a fair demand for Wire Rods, there is corresponding activity in Wire Rods, but users are purchasing conservatively. Prices are held without change at the following quotations: Bessemer, \$35; Basic, \$36; Chain, \$37, all at Pittsburgh.

Rails and Track Supplies.—Not only has the week developed no new business in Standard Sections Rails, but inquiries indicating the likelihood of additional purchases of round lots by important railroads are likewise lacking. Among the small Rail orders recently placed, of which a few are coming in from time to time, was 500 tons purchased by the Manistee & Northeastern Railroad; also 400 tons of high T rails were taken by the Pennsylvania Steel Company. The work of rehabilitating the Chicago street car lines has so far this year resulted in the placing of 16,000 tons of Rails and track material. Of this tonnage 8000 tons of Girder Section Rails were placed last week, together with 500 tons of Guard Rails, all of which went to the Lorain Steel Company. Some improvement is noted in Light Rails, though the aggregate tonnage is still light; among the bookings of the week were 2000 tons taken by the Illinois Steel Company. The demand for Track Fasten-

ings is only moderate, and no purchases of noteworthy importance are reported. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts, and 2.40c. to 2.50c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., \$28; 20-lb., \$29; 16-lb., \$30; 12-lb., \$31. Standard Sections, \$28, f.o.b. mill, full freight to destination.

Structural Material.—The tardy development of Structural projects has resulted in the closure of but few contracts of considerable tonnage during the week. Included in these were 660 tons for the St. Regis apartment building, St. Louis, and 400 tons for the Schmeidel Building, San Francisco, contracts for which were awarded to the American Bridge Company. Plans for the construction of a large building for the American Tobacco Company, which have been held in abeyance for several months, have been revived and fabricators are figuring on the 3500 tons of material involved. Bids are in for several other building structures on which early lettings are expected. Bids were received last week on 600 tons required for the Polk street bascule bridge, but it is understood that the contract has not yet been definitely awarded. A fair amount of business in railroad bridge and viaduct work is in sight, but nothing of importance in this line was included in the week's transactions. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., 1/4-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.98c., in addition to the usual extras.

Plates.—An order for 300 tons of Plates for harbor work at Superior, Wis., has been placed with an Eastern mill. Outside of this transaction the new business entered consists of routine orders for immediate consumption. Both the Sheared and Universal Plate mills at the South Works are at present idle awaiting the accumulation of sufficient tonnage to warrant starting up. Regular prices are being generally adhered to, save for the concessions of \$1 or \$2 a ton, which continue to be made on narrow sizes by some of the smaller mills. We quote for mill shipments as follows: Tank Plates, 1/4-in. and heavier, wider than 6 1/4 and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for 1/4-in. and heavier, with the same advance for lighter weights; Sketch plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, 1/4-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—There has been considerable slowing up in new business. Though it is apparent from the quick shipments desired by consumers that stocks in the hands of jobbers and manufacturers are low, there is no buying ahead by either interest. Store business is exceedingly quiet, both on Black and Galvanized Sheets. Some shading of prices is reported. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—Of the Steel Bar mills in this district, only the Sylvan mills of the Republic Iron & Steel Company are this week in operation. The accumulation of specifications is too slow to permit any of them to run more than a few days at a time. Iron Bars are a little more active, but most of the mills continue to run intermittently. Some very low prices have been made on Scrap Steel Bars, and the regular prices of Bar Iron are not being uniformly maintained. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—While advancing very slowly, some gain is reported in the general demand, and, in the aggregate, this month's business is expected to overreach that of March. It is evident, however, from the way jobbers are

buying, that stocks are nowhere being increased. Even the largest concerns, which ordinarily buy 5 to 10 cars at a time, are ordering in single carload lots. The coming of open weather has not resulted in the degree of improvement expected. The following mill discounts are quoted: Black Pipe, $\frac{3}{4}$ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, $\frac{3}{4}$ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black Steel Pipe, $\frac{3}{4}$ to 6 in. From two to three points above these prices is asked for Iron Pipe.

Boiler Tubes.—There is no business in Tubes save in small lots for immediate delivery. Warehouse stocks are much reduced, and there is no disposition or incentive to increase them. Locomotive Tubes are moving slowly, the principal demand being for such repair work as is absolutely necessary to maintain motive power equipment. What irregularity in price has developed is restricted to concessions made by one or two unimportant mills. Mill quotations for future delivery, on the base sizes, are as follows: 2 $\frac{1}{2}$ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2 $\frac{1}{2}$ in. and smaller, and lengths over 18 ft., and 2 $\frac{1}{2}$ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1 $\frac{1}{2}$ in.....	.35	35	35
1 $\frac{1}{2}$ to 2 $\frac{1}{4}$ in.....	.50	35	35
2 $\frac{1}{4}$ in.....	.52 $\frac{1}{2}$	35	35
2 $\frac{1}{2}$ to 5 in.....	.60	47 $\frac{1}{2}$	47 $\frac{1}{2}$
6 in. and larger.....	.50	35	..

Merchant Steel.—Trade in miscellaneous shapes and the various grades of Merchant Steel used by implement makers is practically dormant. No new business of any consequence is being offered, and the volume of specifications coming out is disappointingly small. In the absence of any particularly attractive tonnage, calculated to test the market, prices are reported to be even and undisturbed, except for possible shading of Shafting discounts. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1 $\frac{1}{2}$ x $\frac{1}{2}$ in., 1.93c., base, Steel card; Iron Finish, 1 $\frac{1}{2}$ x $\frac{1}{2}$ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, $\frac{3}{4}$ to 1 in., 2.28c., and 1 $\frac{1}{4}$ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46 $\frac{1}{2}$ c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7 $\frac{1}{4}$ c. to 8c., and still higher prices are asked on special grades. Shafting, 56 per cent. off in car lots; 52 per cent. less than car lots, base territory delivery.

Cast Iron Pipe.—The placing of 2200 tons of Water Pipe at Cincinnati, which was awarded to the Dimmick Pipe Company, constitutes the chief transaction for the week. The sizes included in this tonnage ranged from 4 in. to 24 in., and the successful bid was a flat price of \$21.70 a ton. The city of St. Louis is expected to come into the market about May 1 for between 4000 and 5000 tons; this is the only municipal letting of considerable size reported for the near future. The city of Collinsville, Ill., is scheduled to open bids for about 350 tons on April 23. The amount of tonnage developing from small orders is fairly good, the principal interest having booked between 4000 and 5000 tons of such business within a week. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., \$27; 6 to 12 in., \$26; 16-in. and up, \$25; with \$1 extra for Gas Pipe.

Metals.—While Copper prices are practically unchanged, there has been considerable falling off in the demand from all sources. Notwithstanding the shrinkage of values, which has cut last year's maximum prices in half, buyers are not disposed to buy ahead of their actual needs; corresponding lethargy of movement is noted in other Metals, and the demand for Old Metals is extremely inactive. We quote as follows: Casting Copper, 13 $\frac{1}{4}$ c.; Lake, 13 $\frac{1}{4}$ c. to 14c., in car lots for prompt shipment; small lots, $\frac{1}{4}$ c. to $\frac{3}{4}$ c. higher; Pig Tin, car lots, 33c.; small lots, 33 $\frac{1}{4}$ c.; Lead, Desilverized, 4c. to 4.25c., for 50-ton lots; Corroding, 5.35c. to 5.45c., for 50-ton lots; in car lots, 2 $\frac{1}{4}$ c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 12 $\frac{1}{4}$ c., and other grades, 10 $\frac{1}{2}$ c. to 11c.; Sheet Zinc is \$7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12 $\frac{3}{4}$ c.; Heavy Copper, 12 $\frac{3}{4}$ c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12c.; Yellow Brass, 10 $\frac{1}{4}$ c.; Light Brass, 6 $\frac{1}{2}$ c.; Lead Pipe, 3 $\frac{3}{4}$ c.; Zinc, 3 $\frac{3}{4}$ c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Old Material.—Extreme dullness rules the market throughout, save for a moderate spurt of activity that has developed in Re-rolling Steel Rails. Owing to the small amount of relaying being done by the railroads there are fewer Old Rails being offered than usual, and this fact, coupled with the known requirements of some of the re-rolling mills, has had a tendency to firm up the market slightly on this material. Cast Scrap is almost wholly neglected, there being practically no demand from the Iron foundries. A few sales of moderate tonnage to consumers of Heavy Melting Steel are reported. Railroad offerings for the past two weeks have been unusually light. Only a few hundred tons were closed last week, and but one lot of

about 4500 tons is announced for the present week. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails.....	\$15.00 to \$15.50
Old Steel Rails, re-rolling.....	13.00 to 13.50
Old Steel Rails, less than 3 ft.....	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection.....	20.50 to 21.50
Old Car Wheels.....	13.50 to 14.00
Heavy Melting Steel Scrap.....	11.00 to 11.50
Frogs, Switches and Guards, cut apart.....	11.50 to 12.00
Mixed Steel.....	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates.....	\$13.00 to \$13.50
Iron Car Axles.....	16.00 to 16.50
Steel Car Axles.....	14.75 to 15.25
No. 1 Railroad Wrought.....	11.00 to 11.50
No. 2 Railroad Wrought.....	10.00 to 10.50
Railway Springs.....	11.00 to 11.50
Locomotive Tires, smooth.....	13.25 to 13.75
No. 1 Dealers' Forge.....	9.00 to 9.50
Mixed Busheling.....	7.00 to 7.50
Iron Axle Turnings.....	5.75 to 6.25
Soft Steel Axle Turnings.....	5.75 to 6.25
Machine Shop Turnings.....	5.25 to 6.25
Cast Borings.....	4.50 to 5.00
Mixed Borings, &c.....	4.50 to 5.00
No. 1 Mill.....	6.75 to 7.25
No. 2 Mill.....	5.75 to 6.25
No. 1 Rollers, cut to Sheets and Rings.....	7.00 to 7.50
No. 1 Cast Scrap.....	12.00 to 12.50
Stove Plate and Light Cast Scrap.....	10.00 to 10.50
Railroad Malleable.....	10.00 to 10.50
Agricultural Malleable.....	9.50 to 10.00
Pipes and Flues.....	7.75 to 8.25

Cleveland.

CLEVELAND, OHIO, April 21, 1908.

Iron Ore.—Many of the blast furnace interests that a few weeks ago were in favor of maintaining last year's prices on Ore have changed their position on the matter and are now urging the merchant Ore firms to make a reduction in prices. Although last season's prices were reaffirmed at a meeting of the Ore and furnacemen, held in this city last February, the matter could be taken up again with the view of determining whether a reduction in prices should be made. Ore shippers, however, are disposed to stand by the established prices, and for the present at least will do nothing about reopening the price question for the reason that they realize that nobody wants to buy any Ore now. As weeks pass the time when consumers will come in the market for Ore does not appear to grow any nearer. A buying movement had been expected in April or May at the latest, but no Ore has been sold as yet and present indications are that very little will be bought next month, and that there will be little for the lake freighters to do in the way of carrying Ore at the first of June, when it was generally understood that shipments would begin. There are very few consumers who will not have enough of last season's Ore to last them until well along in the fall, and it is believed that a large share of the furnace interests will wait until the middle of summer before buying any. By that time they can tell more accurately the amount they will need to last them until the opening of the 1909 season of navigation, and they will not have to begin paying for this season's purchases so soon. Conditions have changed the estimates of the amount that will be required this season, and Ore men who a few weeks ago placed the amount at 25,000,000 tons now make a maximum estimate of 20,000,000 tons. The Marine Engineers' Beneficial Association, the lake engineers' union, has taken official action opposing the open shop on lake boats, but the chief engineers have continued to sign individual contracts with the vesselmen, and it is now estimated that fully 400 engineers have signed contracts for the season. No labor troubles are expected as far as the engineers are concerned. On May 1 the two-year contract between the Lake Erie dock managers and the 'longshoremen who handle the Ore and Coal will expire. It is believed that the open shop policy will be adopted this season by the dock managers. Engineers of 12 of the largest boats of the Pittsburgh Steamship Company reported for duty at their boats yesterday, and the work of fitting out the boats was started. They will be ready to sail in about two weeks. The owners and managers of the independent freighters have reached an agreement not to start their boats before May 12. Another meeting will be held on that date, and unless business conditions warrant the starting of the boats at that time a later date will be set for placing the boats in commission. Ore shipments from the docks are still very light. The expected increase in shipping orders has not materialized, and some dealers are shipping less this month than in March. Prices for 1908 delivery at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range Non-Bessemer, \$4.20; Mesaba Non-Bessemer, \$4; Siliceous Bessemer, \$2.75; Siliceous Non-Bessemer, \$2.35 to \$2.60.

Pig Iron.—The market continues weak and inactive. Low prices that have been quoted on Foundry Iron in the past two weeks have not stimulated any buying, although it seems to be the opinion that prices are about at the bottom. The only inquiries of any size noted were one for 200 tons for Ohio delivery, and another for 500 tons for delivery in

Chicago territory. Furnacemen have ceased to place much importance in inquiries for the reason that a few good sized inquiries recently have resulted a week or two later in an order for a single car lot. The sales of the week have been limited to a few car lots, and the demand has been insufficient to test the market thoroughly. No. 2 Foundry Iron is still being quoted nominally at \$15.25 to \$15.50, Valley furnace, but this price is being shaded to \$15, and there are reports that No. 2 Iron is being offered below \$15. Local furnacemen are asking \$16.35 to \$16.50, delivered, Cleveland, and \$16, at furnace, for No. 2 for outside shipment, but these prices would be shaded considerably to meet competition. The local melt shows little, if any, improvement. There are still thousands of tons of Iron sold on contract last year at a price averaging about \$22, awaiting shipment from furnace stock piles. The furnace of the Detroit Iron & Steel Company has gone in blast. Reports received by local Ore firms indicate that at least three more merchant furnaces in the Middle West will go out of blast within the next few weeks. Southern Iron is reported to have been offered as low as \$11.25, Birmingham, for No. 2. There is no inquiry for Bessemer or Basic Iron. For prompt shipment we quote, delivered, Cleveland, as follows:

Bessemer	\$17.65
Northern Foundry, No. 1.....	\$16.50 to 17.00
Northern Foundry, No. 2.....	16.00 to 16.50
Northern Foundry, No. 3.....	15.50 to 16.00
Southern Foundry, No. 3.....	15.85 to 16.35
Gray Forge.....	15.40

Coke.—The market is very quiet and prices are weaker. We quote Connellsville Furnace Coke for spot shipment at \$1.50 to \$1.75, at oven, and 72-hr. Foundry Coke at \$2 to \$2.25, at oven, for spot shipment. One producer who has been asking \$2.50 has reduced his price to \$2.40.

Finished Iron and Steel.—The market is quiet in all lines and sales of small lots even are quite limited. Specifications continue about as they have for several weeks, being all for small tonnages. The demand for Iron Bars has not improved and local mills are running scarcely half the time. The Bar Iron market continues weak and in some cases the usual price of 1.40c., Pittsburgh, is being shaded to 1.35c. A few mills are attempting to maintain the regular price of 1.50c. The mill price on Steel Bars is being firmly maintained, but in some cases low prices, below these quoted, have been named by jobbers for Steel Bars out of warehouse. The demand for Plates and Sheets shows no improvement and is still very light. Independent mills are shading the price of the narrower sizes of Plates \$2 a ton and are making concessions of from \$1 to \$2 a ton on Sheets. The Structural outlook shows no improvement. With the exception of specifications for a small tonnage for railroad bridge work there has been no activity in this line, and there is no work in sight that will require a good sized tonnage. Consumers of all kinds of Finished Material continue to specify only for their immediate requirements, which in most cases are light. We quote Iron Bars at 1.50c., Cleveland for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, 1/4-in. and heavier, 1.80c., Cleveland. Dealers quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers quote Steel and Iron Bars at 1.70c. to 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2 3/4 to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount. Jobbers report a fair demand for Shafting, but no improvement in other lines.

Old Material.—The market seems to grow duller from day to day, and is fully as inactive as it has been at any time in the past six months. With some of the mills shut down and others running only part of the time, the consumption is light and there are few inquiries even for small lots of Scrap to supply immediate needs. Prices are weak but the absence of sales makes all quotations largely nominal. Among the railroad offerings this week are lists from the Lake Shore and the Nickel Plate. The former road will sell from 1200 to 1500 tons of Scrap. Dealers' prices to the trade are as follows, per gross ton, f.o.b. Cleveland:

Old Steel Rails.....	\$11.00 to \$11.50
Old Iron Rails.....	15.00 to 16.00
Steel Car Axles.....	17.00 to 18.00
Old Car Wheels.....	13.00 to 13.50
Relaying Rails, 50 lb. and over.....	21.00 to 22.00
Heavy Melting Steel.....	11.00 to 11.50
Railroad Malleable.....	12.00 to 12.50
Agricultural Malleable.....	11.00 to 12.00
Light Bundled Sheet Scrap.....	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles.....	\$16.00 to \$18.50
Cast Borings.....	5.00 to 5.50
Iron and Steel Turnings and Drillings..	6.00 to 7.00
Steel Axle Turnings.....	7.50 to 8.00
No. 1 Bushelling.....	10.50 to 11.00
No. 1 Railroad Wrought.....	12.00 to 12.50
No. 1 Cast.....	12.00 to 12.50
Stove Plate.....	10.00 to 10.50
Bundled Tin Scrap.....	8.00 to 9.00

Cast Iron Pipe.—The Board of Public Service, Youngstown, Ohio, has awarded a contract to the Massillon Iron & Steel Company, Massillon, Ohio, for 500 tons of Cast Iron Water Pipe, at \$21.60 per ton.

Cincinnati.

CINCINNATI, OHIO, April 22, 1908.—(By Telegraph.)

In all divisions of the Iron and Steel trade, from crude to finished product and including Old Material as well, the minimum of action and interest seems to have been reached this week, for the various factors for the first time in this territory this year confess to something like actual stagnation. What buying is going on is of the rush order and for absolutely current needs, and for those needs only. Nothing is heard of the last half; everybody seems inclined to let that part of the year take care of itself. From the nature of inquiries received it seems that there is quite a volume of business in sight, but that consumers are simply holding off, and, in the case of Pig Iron at least, for lower prices. The financial situation is so much improved that the excuse for retarded developments must be laid to other causes. Certain it is that business does not respond.

Pig Iron.—Whatever may have been accomplished by the furnace people in the way of a better understanding and in the interests of harmony at the recent meeting in New York, it certainly is not in evidence in this market. Rumors of price cutting are more numerous, and agents seem to be more aggressive than ever in soliciting offers. The situation seems to portend a further blowing out of furnaces; in fact, since our last report one of the Sloss stacks is out, the Philadelphia at Florence, Ala., and furnaces in other districts, it is said, are to be blown out on signs of further recessions. It is reported that another of the largest interests in the Birmingham District has very little Iron to offer prior to July 1. There is a generally firm adherence by agents to \$12, Birmingham, in quoting on Southern Iron, but so much is heard of this price being shaded that it is practically certain a round tonnage for this quarter's delivery would bring out \$11.50, and perhaps \$11. There are rumors heard of \$11.50 on a modest tonnage for Chicago consumption. The largest Pipe interest has, it is thought, purchased a 1500 ton lot of No. 2 Soft and Nos. 3 and 4 Foundry for immediate delivery to its Tennessee plant, at a specially attractive price. It is conceded that there is little southern Ohio Iron moving at the present price in competition with Southern Irons. While there is undoubtedly some heavy cutting going on in the Valley District for delivery in that territory, it does not affect the business of the Ironton furnaces to this territory. Reports of \$15 on the former are frequent, but \$15.50 is about the lowest heard on the Ironton product. Apparently confirming the statement that there is a scarcity of low grade Irons on Southern furnace yards, a prominent agency has declined an offer of \$10.80 on 2000 tons of No. 4 Foundry. There seems to be no demand for Basic nor in fact anything outside the hurry orders from Foundry and pipe interests for small lots. Eight per cent. Ohio Silvery is still quotable at \$18.50, at furnace. Standard Southern Car Wheel Irons are a little off, and it is understood that \$19, at furnace, has been done. The foundry melt is improving, but very slowly, and local foundrymen are buying occasionally, but only as needed, and the aggregate of this business would not total a fair-sized tonnage in normal times. For immediate delivery and balance of the second quarter we quote f.o.b. Cincinnati, with freight rates of \$3.25 from Birmingham, and \$1.20 from the Hanging Rock District, as follows:

Southern Coke, No. 1.....	\$15.75
Southern Coke, No. 2.....	15.25
Southern Coke, No. 3.....	14.75 to \$15.25
Southern Coke, No. 4.....	14.25 to 14.75
Southern Coke, No. 1 Soft.....	15.75
Southern Coke, No. 2 Soft.....	15.25
Southern Coke, Gray Forge.....	13.75 to 14.25
Southern Coke, Mottled.....	13.25 to 13.75
Ohio Silvery, 8 per cent. Silicon.....	19.70
Lake Superior Coke, No. 1.....	17.20 to 17.70
Lake Superior Coke, No. 2.....	16.70 to 17.20
Lake Superior Coke, No. 3.....	16.20 to 16.70
Standard Southern Car Wheel.....	22.25 to 22.75
Lake Superior Car Wheel.....	22.00 to 22.50

(By Mail.)

Coke.—The leading sellers in this market report Coke undeniably quiet, with some exceedingly attractive inducements for spot buyers. Some agencies claim a satisfactory movement in Foundry grades, although very little contracting is being done on any kind of Coke. Connellsville 72-hr. Foundry is quoted by one interest at \$2.15 to \$2.40; Poca-hontas, \$2.15 to \$2.25; Virginia grades, choice, \$2.25 to \$2.40; New River, best price heard, \$2.75, all at oven. On Furnace grades as low as \$1.40 is heard, with open quotations of \$1.65 to \$1.75 at oven; on forward deliveries about \$1.75 to \$2.

Finished Iron and Steel.—Store prices remain unchanged, and there seems to be a trifle more business going than last week, although buying is still in very small lots, as needed. There is a little more interest in Iron Bars. Inquiries from Southern districts indicate that with any kind

of improvement in the general situation inducing a feeling suggestive of restoration of confidence in Governmental regulations in commerce and trade, the second half should open with something like a normal condition in that section. Dealers quote, f.o.b. cars Cincinnati, as follows: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, 1/4-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—The local market is, if possible, weaker than ever. There is no interest in any line of Scrap. The few requirements of Steel mills in this section were supplied early in the year, and there is no indication of any needs for some time to come along these lines. The inquiry at the present time is referred to by dealers as being the lightest in their experience of a decade or more. Prices, as nearly as they can be gauged from an uninterested market, are about as follows, and are f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton.....	\$10.50 to \$11.50
Cast Borings, net ton.....	4.00 to 5.00
Heavy Melting Steel Scrap.....	11.00 to 11.50
Steel Turnings, net ton.....	5.00 to 6.00
No. 1 Cast Scrap, net ton.....	12.00 to 13.00
Burnt Cast and Wrought, net ton.....	8.00 to 9.00
Old Iron Axles, net ton.....	14.50 to 15.50
Old Iron Rails, gross ton.....	13.00 to 14.00
Old Steel Rails, long, gross ton.....	11.00 to 12.00
Old Steel Rails, short, gross ton.....	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton.....	21.00 to 22.00
Old Car Wheels, gross ton.....	12.00 to 13.00
Low Phosphorus Scrap, gross ton.....	13.00 to 14.00

Pittsburgh.

PARK BUILDING, April 22, 1908.—(By Telegraph.)

Pig Iron.—With the market on Pig Iron practically open and no improvement in the demand, which is still for small lots for prompt shipment, prices seem to have further weakened, and reports are that all grades of Pig Iron are being sold at lower prices than have ruled at any time since the decline in the market started. The top of the market on Bessemer Iron is \$16.50, Valley furnace, but several sales of 100 ton lots have been made at \$16.35, equal to \$17.25, Pittsburgh. Basic Iron is nominally \$15.50 at furnace, but \$15.25 or lower could be done on a firm offer and for any considerable tonnage. Specifications against contracts for Basic Iron are coming in more freely, and shipments this month by the Valley furnaces will be much heavier than in March. We note a little more inquiry for Foundry Iron. One local consumer is inquiring for 300 tons for April, May and June, and a sale has been made of 250 to 300 tons of Northern No. 2 Foundry analysis Iron at \$15, Valley furnace, or \$15.90 Pittsburgh. We quote Northern No. 2 Foundry at \$15.25, Valley furnace, but for any considerable tonnage and to desirable customers \$15 could be done.

Steel.—The American Sheet & Tin Plate Company and independent Sheet and Tin manufacturers are specifying quite freely against contracts for Sheet and Tin Bars, shipments by the Steel mills being heavier at present than for some time. Reports are still current that both Billets and Sheet Bars are being offered at \$1 to \$2 a ton less than regular prices, but these reports continue to be strongly denied by the leading Steel mills, who insist that they are absolutely maintaining prices. We quote Bessemer Billets at \$28, Pittsburgh, and \$28.50, Youngstown or Wheeling. Sheet and Tin Bars take an advance of \$1 a ton over these prices. Forging Billets are about \$30, Pittsburgh.

(By Mail.)

General conditions are about as quiet as they have been at any time this year. On some lines, such as Tin Plate, Pipe and Wire Products, the demand is heavier but the increased buying in these lines is offset by the falling off in Plates, Structural Material and Steel and Iron Bars. There are persistent reports of cuts in prices on Finished lines, but these are strongly denied. The fact is that hardly enough tonnage is being offered to test the market thoroughly on anything. It is now the general belief that with the assurance of good crops this year and the Presidential nominations out of the way, the Iron trade will show betterment. It is confidently expected that the last half of the year will make a better showing than the first half.

Ferromanganese.—There is practically no inquiry, and prices are weak. We quote best grades of foreign 80 per cent. Ferro at \$42, seaboard, or \$43.95, Pittsburgh. We have not heard of any sales in this market in the last week or two.

Muck Bar.—One or two small inquiries are in the market, but the tonnage has not yet been closed. The nominal price of best grades of Muck Bar made from all Pig Iron is \$27, Pittsburgh, but on a firm offer there is no doubt that this price would be materially shaded.

Skelp.—A sale of about 1000 tons of Sheared Steel Skelp is reported on the basis of about 1.65c., Pittsburgh. There is a little more general inquiry, but the tonnage of actual orders placed with the mills for some time past has been light. We quote Grooved Steel Skelp, 1.55c. to 1.60c.; Sheared Steel Skelp, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh.

Rods.—There is more inquiry for Chain Rods, but the demand for Rods for Wire purposes has been light for some time. Regular prices on Rods are unchanged, being \$35 for Bessemer, \$36 for Open Hearth and \$37 for Chain Rods, f.o.b. Pittsburgh.

Steel Rails.—The Carnegie Steel Company took last week a contract for 2235 tons of Standard Sections for export, and has received specifications against old contracts sufficient to warrant starting up the three Edgar Thomson Rail mills, which was done on Sunday night, April 19, but these mills are gauged to about 30 per cent. of capacity. The demand for Light Rails is only fair. Regular prices on Light Rails continue to be shaded about \$3 a ton on most of the tonnage that is being placed. One mill in particular that rerolls Rails is a very aggressive seller, and is held responsible for the low prices ruling on Light Sections. Regular prices on Light Rails, which continue to be shaded from \$3 to \$4 a ton by rerolling mills, are as follows: 25 to 45 lb. Sections, \$28; 20-lb., \$29; 16-lb., \$30, and 12-lb., \$32. We quote Standard Sections at \$28, at mill, and Angle Splice Bars at 1.65c., at mill.

Structural Material.—The Second National Bank Building, at Connellsville, about 460 tons, is to be placed April 27, and an addition to the Court House, at Ebensburg, Cambria County, Pa., is also to be placed this week. Nothing has been heard as yet from the proposed Lake Erie bridge at Beaver, about 14,000 tons, or the addition to the Fort Pitt Hotel, about 1800 tons. The projected Oliver Building has practically gone over until next year. The mills are able to make practically spot shipment on the small amount of new business that is being placed. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x 1/4 in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3 1/2 in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—With the Steel car interests and the Lake boat builders out of the market as buyers of Plates, the only orders coming in are for small lots from the boiler makers and the other general trade, but this is only sufficient to give the Plate mills about 25 per cent. of what they require to keep them running to full capacity. There are reports of material concessions having been made in prices of Plates, but these are officially denied, the statement being made that the only cutting being done is by a few small mills, mostly on the narrow sizes, and does not exceed \$1 to \$2 a ton. Regular prices are as follows: Tank Plates, 1/4-in. thick, 6 1/2 in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than 1/4-in. to and including 3-16-in.	
Plates on thin edges.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 in.....	.05
Plates over 110 to 115 in.....	.10
Plates over 115 to 120 in.....	.15
Plates over 120 to 125 in.....	.25
Plates over 125 to 130 in.....	.50
Plates over 130 in.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Firebox Steel Plates.....	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—There has been a material increase in the demand for both Black and Galvanized Sheets, while consumers like the Westinghouse Electric and others are taking out a larger tonnage of electrical Sheets than for some time. The American Sheet & Tin Plate Company is increasing its active Sheet mill capacity, and the American Rolling Mill Company is operating its works at Middletown, Ohio, practically full, and expects to start its Zanesville plant within a week. Prices, in the main, are being observed, but are occasionally shaded by some mills that absorb part of the freight. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.;

Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, \$1.75 per square, and Galvanized Roofing Sheets, No. 28, \$3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Cotton Ties.—A fairly large tonnage has been placed in Cotton Ties since the season opened about two weeks ago, but it is not believed the trade this year will be as heavy as last year, largely owing to the general business depression. We quote as follows: 3000 bundle lots and over, 85c.; less than 3000 bundle lots, 88c., f.o.b. Pittsburgh.

Hoops and Bands.—A fair tonnage is being specified for against contracts, but practically no new business is being placed. We quote at \$3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Tin Plate.—This is probably the most active in demand of any article on the entire list of Finished Iron and Steel, and the outlook for the next two or three months is regarded as quite satisfactory. The American Sheet & Tin Plate Company is operating about 85 per cent., and the independent mills about 75 per cent. of Tin Plate capacity. We are advised that prices are being maintained, reports that cutting is being done being strongly denied by leading producers. We quote at \$3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—As yet new business in either Iron or Steel Bars does not show any improvement, orders being for small lots for actual needs. It is estimated that not more than 25 per cent. of the total capacity in Iron and Steel Bars is active at the present time. It is strongly denied that Common Iron Bars are being generally offered by leading producers as low as 1.35c., Pittsburgh. On the contrary, it is claimed that this is being done by only a few small mills that have a limited capacity and that do not cut much figure in the Bar Iron trade. It is also stated that the tone of the market on Iron Bars is stronger now than it has been for some weeks. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm, at 1.60c., Pittsburgh.

Railroad Spikes.—Local makers report that purchases are confined to small orders for actual needs. We quote: Standard sizes, 4½ x 9-16 in., at \$1.70, and the smaller sizes at \$1.80 per 100 lb. in carloads and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Spelter.—The market is quiet, but prices are fairly strong and are practically unchanged. We quote prime grades at 4.50c., East St. Louis, but on a firm offer it is probable that 4.45c., East St. Louis, equal to 4.57½c., Pittsburgh, could be done.

Merchant Steel.—This trade continues quiet, and so far the lower prices recently made on Shafting have not stimulated the demand. There is a fair inquiry for Tire and Spring Steel, but practically all the tonnage being placed, and it is not heavy by any means, is in small lots for actual needs. We quote Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Nominal prices on Merchant Steel are as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c. Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b. at mill.

Coke.—The Coke trade continues in a most unsatisfactory condition, and additional ovens in the Connellsville and outside regions have been blown out. It is stated officially that at present about only 25 per cent. of the ovens in the most prominent Coke regions are active. We quote best grades of Furnace Coke for prompt shipment from \$1.55 to \$1.60, but other grades not so favorably known have sold as low as \$1.40, at oven, or even lower in some cases. Foundry Coke is held at \$1.85 up to \$2.25 a ton, at oven, the latter price for Connellsville grades. The Upper and Lower Connellsville regions made last week only about 140,000 tons.

Pipes and Tubes.—In a general way the Pipe trade is showing betterment, the demand being fairly active and representing probably 50 per cent. of capacity. It is re-

ported, but not confirmed, that a leading interest has recently placed an order for over 100 miles of 8-in. Line Pipe. A number of other such projects are in the market, which, if placed, will total a heavy tonnage. Spang, Chalfant & Co., Inc., will start up in a few days their puddling department to make Muck Bar for their Skelp mills. It is stated that prices on both Iron and Steel Pipe, which are guaranteed against decline until May 15, are being absolutely maintained by the mills. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

	Merchant Pipe.		Jobbers, carloads.	
			Steel.	
	Black.	Galv.	Black.	Galv.
¾ to 1¼ in.	65	49		
1 in.	67	53		
1½ in.	69	57		
2 to 6 in.	73	63		
7 to 12 in.	70	55		
Extra strong, plain ends:				
¾ to 1¼ in.	58	46		
1 to 4 in.	65	53		
4½ to 8 in.	61	49		
Double extra strong, plain ends:				
1½ to 8 in.	54	43		

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
¾ and 1¼ in.	63	51
1 in.	65	53
1½ in.	67	55
2 to 6 in.	71	61
7 to 12 in.	68	53
Extra strong, plain ends:		
¾ to 1¼ in.	56	44
1 to 4 in.	63	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
1½ to 8 in.	52	41

Boiler Tubes.—There is only a fair amount of new business being placed, no large contracts by the railroads having been given out for some time. Prices are occasionally shaded. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

	Iron.	Steel.
1 to 1½ in.	42	47
1½ to 2¼ in.	42	59
2½ in.	47	61
2½ to 5 in.	52	65
6 to 13 in.	42	59
2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.		
2½ in. and larger, over 22 ft. long, 10 per cent. net extra.		

Iron and Steel Scrap.—This trade is practically neglected, consumers taking in only such material as they absolutely need, and the amount of tonnage moving is very light. It is pointed out that Scrap dealers who have yards of their own and are in position to buy Scrap and hold it for a time will certainly realize higher prices later on. Bundled Sheet Scrap continues excessively weak, there being an overproduction of this material, and it is being offered at very low figures. In the absence of definite sales on which to base prices, we quote the different grades of Scrap nominally as follows, per gross ton: Heavy Steel Scrap, Pittsburgh, Sharon and Steubenville delivery, \$12.75 to \$13; No. 1 Railroad Wrought Scrap, \$13.75 to \$14; No. 1 Cast Scrap, \$15 to \$15.25; Cast Iron Borings, \$7.75 to \$8. Steel Axles are \$16.50 to \$17; No. 1 Busheling Scrap, \$12 to \$12.25; No. 2, \$9 to \$9.25; Sheet Bar Crop Ends, \$16.50 to \$17; Iron Axles, \$19 to \$19.50; Low Phosphorus Melting Stock, \$16.25 to \$16.50; Re-rolling Rails, \$14 to \$14.25; Old Steel Rails, short pieces for Open Hearth use, \$12.75 to \$13; Machine Shop Turnings, \$8 to \$8.50; Railroad Malleable Scrap, \$12.25 to \$12.50; Grate Bars, \$13.25 to \$13.50; Heavy Air Furnace Cast Scrap, \$13.75 to \$14.

Birmingham.

BIRMINGHAM, ALA., April 18, 1908.

Pig Iron.—More inquiries are reported, and the sentiment of all parties concerned appears to have improved, yet the transactions recorded are not unlike those of last week's report, and the aggregate of sales is but slightly in excess. The agreement reached at the recent New York meeting to maintain quotations on a basis of \$12, Birmingham, for No. 2 Foundry, is believed to have been made in good faith, and producers generally are of the opinion that a decline from such a basis will not be suffered. The fact remains, however, that all Southern interests did not enter the agreement, and there are no indications that the demand will be stimulated in the near future to such an extent that concessions on the part of independent concerns, though the producing capacity represented be comparatively small, would be without a material effect. Within the week carload lots have sold for \$12, but no sales are reported at lower figures. The quotations made on the recent inquiry for 12,000 tons cannot be ascertained, and the only sale known to have resulted was 150 tons on a basis of \$12, Birmingham. A lot of 500 tons

for delivery during May, June and July brought \$12.25 for No. 2, and 100 tons for delivery within the next 30 days was sold at the same price. An offer of \$12.25 for 500 tons to be delivered during the third quarter is known to have been refused. The sale of approximately 5000 tons of High Manganese Iron is reported at \$13. By fracture, this sale would represent a price of from \$12 to \$12.50 for No. 2 Foundry. As to the reported sale of approximately 100,000 tons by a Southern concern for export, inquiry at local offices fails to result in a confirmation, and the fact that the concern to which the sale is accredited could not fill such an order without the operation of capacity now idle further removes the likelihood of its having been made.

Cast Iron Pipe.—As the season advances, the prospects for new business are brighter. The ability to dispose of municipal bonds at a greater advantage is noted, and by reason of the fact that more satisfactory terms of payments can be arranged, the large contracts now in sight are of especial interest. Among the cities reported to be contemplating extensions in the near future are Atlanta, Ga., Council Bluffs, Iowa, and Hope, Ark. It is also stated upon good authority that the bond issue for the proposed improvement and extension to water works at San Francisco, Cal., is practically certain, while reports from Cuba favor lettings of consequence in addition to those recently advertised. The production has been increased materially within the week, and the active capacity in the immediate vicinity is now close to normal. Prices continue to cover a wide range, but we do not consider revision of quotations warranted. Nominal quotations on Water Pipe are as follows, per net ton, f.o.b. cars here: 4 in. to 6 in., \$23; 8 in. to 12 in., \$22; over 12 in., average \$21, with \$1 per ton extra for Gas Pipe. These quotations are probably shaded on large contracts.

Old Material.—An increase in the number of sales received is noted, and more sales have resulted. Purchasers are still inclined to limit their engagements to actual requirements, however, and the aggregate does not reach large proportions. Prices received have covered a wide range, with a tendency to weaken, but a revision of quotations is not authorized, and we quote nominally as follows, per gross ton f.o.b. cars here:

Old Iron Rails.....	\$16.50 to \$17.00
Old Iron Axles.....	15.50 to 16.00
Old Steel Axles.....	13.50 to 14.00
No. 1 Railroad Wrought.....	13.00 to 13.50
No. 2 Railroad Wrought.....	10.00 to 10.50
No. 1 Country Wrought.....	11.50 to 12.00
No. 2 Country Wrought.....	9.50 to 10.00
Wrought Pipe and Flues.....	10.50 to 10.50
No. 1 Steel.....	11.00 to 11.50
No. 1 Machinery.....	10.50 to 11.00
Stove Plate and Light Cast.....	9.50 to 10.00
Cast Borings.....	6.00 to 6.50

Philadelphia.

PHILADELPHIA, Pa., April 21, 1908.

The outcome of the deliberations of the producers of Foundry Pig Iron from the East, South and West, and the result of the regular monthly meeting of the Eastern Pig Iron Association, both occurring in New York City the latter portion of last week, have been the leading features before the trade. Opinions differ as to the maintenance of the present policy of upholding prices in face of the strong outside competition, and some have expressed themselves in favor of an open market. Under existing conditions it is difficult to determine which policy would be the better to pursue, and therefore prices were reaffirmed pending the call of a further meeting to be held in the near future. The trade under the circumstances is marking time, awaiting developments, and until some definite action is taken regarding the position of producers of crude material buying will likely continue along very narrow lines. The Lehigh & New England Railroad, through the Lehigh Coal & Navigation Company, has placed further orders for both motive power and rolling stock. Five locomotives were ordered from the Baldwin Locomotive Works and the Cambria Steel Company was given an additional order for 50 Steel coal cars. Several bridge orders were also placed by this company, and plans for others are being made, contracts for which will likely be placed in the course of a month or so. The cost of the orders placed will aggregate \$500,000. Outside of this work the railroads have largely maintained their policy of keeping out of the market.

Pig Iron.—The result of the meetings of the Pig Iron producers last week was awaited with interest by the trade, and it was expected that some policy which would relieve the present tension of the market would be adopted. The determination to maintain the former range of prices has had little effect on the trade, which will continue to maintain a waiting policy. Stocks on furnace banks are undoubtedly accumulating, but in the absence of any definite data the effect of the accumulation cannot be estimated. The Eastern furnaces are restricting production still more, and if business continues as dull as it has been recently further curtailments are not unlikely. The Virginia furnaces, which are not affected by any price arrangement, are maintaining

their present prices, but extra efforts will probably be made to get them in line with Eastern producers. The Southern situation is probably the most difficult one, and much will depend on the possibility of getting all of these furnaces to agree to methods or policies which would be satisfactory to themselves and the Eastern producers. The outcome of the further deliberations of the Foundry Iron producers will therefore be awaited with interest. While the Eastern furnaces reaffirm their basis of \$18.25, delivered, for No. 2 X Foundry, there is still enough outside Iron floating around to meet current consumption, and which can be had at 50c. to \$1 under the established rate. That some of the Northern furnace owners, who were cutting pretty heavily heretofore, have again come into the fold and withdrawn all previous quotations, and are now naming the full price, is considered encouraging. In other instances, makers who have been taking considerable Iron at low prices are getting pretty nearly as much tonnage as they want at those figures, and while they will sell small quantities for early delivery quite freely, they are not inclined to take orders for heavy tonnages for forward delivery at to-day's low prices. The business transacted has been extremely light. The bulk of the business has been done in the Foundry grades. There have been more sales of No. 2 Plain Iron, which in a number of cases is replacing No. 2 X buyers, endeavoring to obtain Iron of an analysis just outside of the No. 2 X grade. Eastern furnaces have sold some little Iron at full figures, but the bulk of the business has been done at lower figures. There is again some inquiry around for Pipe Irons, one local maker being in the market for 2500 tons for April and May delivery. Pipe foundries continue taking small lots of off grades of Iron at bargain prices, but the aggregate tonnage is not large. A little better demand has developed for Forge Iron. A sale of a 500-ton lot at full prices has been reported, with several small inquiries still before the trade. Steel making Irons are still uncalled for. The tonnage in Virginia Irons taken in this territory in the past week has been small. Sales of Southern Iron have also been light, although some fair inquiries are before the trade. Prices show little change. Some of the outside interests have been selling Iron in isolated cases at somewhat lower figures, but the following range of prices represents the general run at which sales have been made for second quarter delivery in buyers' yards, eastern Pennsylvania and adjoining territory:

Eastern Pennsylvania, No. 2 X Foundry.....	\$17.50 to \$18.25
Eastern Pennsylvania, No. 2 Plain.....	17.00 to 17.75
Virginia, No. 2 X Foundry.....	17.50 to 17.75
Virginia, No. 2 Plain.....	17.00 to 17.25
Gray Forge.....	16.00 to 16.75
Basic.....	17.25 to 17.50
Low Phosphorus.....	23.50 to 24.00

Ferromanganese.—There is but little demand, and what business has been done is confined to small and broken lots. Prices are unchanged, \$43 to \$44, Baltimore, being named for small lots for prompt delivery.

Steel.—Notwithstanding that mills are running at reduced capacity, business does not come out fast enough to take the output, and in instances mills are piling ingots. The demand is irregular and individual sales are small and for prompt shipment. Prices are unchanged, and buyers show no interest in the market and would probably not buy for future delivery, even at shaded prices. For delivery in the Philadelphia territory ordinary Rolling Steel is quoted at \$29.20, with Forging Steel at \$31.20, with the usual extras for high carbons and large sizes.

Plates.—While there is a fairly good number of orders coming out, the aggregate tonnage is small. Larger propositions appear to be held up, and buying is largely of a miscellaneous nature to cover immediate needs of consumers. Prices are being fully maintained, the following range being named for delivery in this territory:

	Carload.	Part
	cents.	carload.
Tank, Bridge and Boat Steel.....	1.85	1.90
Flange or Roller Steel.....	1.95	2.05
Commercial Firebox.....	2.05	2.10
Marine.....	2.25	2.30
Locomotive Firebox Steel.....	2.35	2.40
The above are base prices for 1/4-in. and heavier. The following extras apply:		
3-16-in. thick.....	\$0.10	
Nos. 7 and 8, B. W. G.....	.15	
No. 9, B. W. G.....	.25	
Plates over 100 to 110 in.....	.05	
Plates over 110 to 115 in.....	.10	
Plates over 115 to 120 in.....	.15	
Plates over 120 to 125 in.....	.25	
Plates over 125 to 130 in.....	.50	
Plates over 130 in.....	1.00	

Structural Material.—The heaviest individual tonnage placed in this territory last week went to the Pennsylvania Steel Company. It included two bridges, one over the Delaware River at Portland, near Easton, Pa., the other over Paulins Kill, near Hainesburg Junction, N. J., which together will require 1500 tons of material. The orders for these were placed by the Lehigh & New England Railroad Company, which also has plans in preparation for a new bridge, requiring some 600 tons of material, over the Delaware River at Slatington, Pa. Outside the above, the orders

taken by the trade have been largely of a miscellaneous character, although several fair sized propositions are under consideration. Prices remain unchanged, 1.85c. to 2c., according to specification, being named.

Sheets.—There has been a little better demand for Sheets recently. No tendency has been shown on the part of buyers to anticipate their wants, but seasonable business for prompt delivery shows an increased volume. Mills, however, do not seem to be able to increase their production. Prices are being fully maintained, the following range being quoted, for mill shipment, with a tenth for small lots: Nos. 18 to 20, 2.50c.; No. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The meeting of the Eastern Bar Iron Association last week resulted in the reaffirmation of the established basis, 1.65c., delivered, in this territory, for Refined Iron Bars, notwithstanding the fact that merchants who have tonnage still due them on old contracts at much lower figures quote as low as 1.40c., Eastern mill. It is understood that orders for 10,000 tons of Bars at the low range of prices are still unspecified on makers' books, and until these are disposed of there is little chance of mills doing much business at the higher figures. The demand is reported light, buying being almost entirely of a hand to mouth character.

Coke.—Small sales of Foundry Coke are reported, with practically nothing being done in Furnace Coke. Prices are weaker and the business done has been largely for prompt shipment. Foundry Coke is quoted at \$2.15 to \$2.40, at oven, with Furnace Coke at \$1.65 to \$1.85, at oven. For delivery in the Philadelphia territory the following range of prices is quoted:

Connellsville Furnace Coke.....	\$3.80 to \$4.00
Foundry Coke.....	4.30 to 4.55
Mountain Furnace Coke.....	3.40 to 3.60
Foundry Coke.....	3.80 to 4.10

Old Material.—The market continues extremely quiet. Sales are few and confined to odd carload lots. Mills show no interest in the market, and prices, while not quotably lower, are weaker. We quote nominally as follows for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory:

No. 1 Steel Scrap and Crops.....	\$12.75 to \$13.25
Low Phosphorus.....	17.50 to 18.00
Old Steel Axles.....	17.50 to 18.00
Old Iron Axles.....	20.00 to 21.00
Old Iron Rails.....	17.00 to 18.00
Old Car Wheels.....	14.00 to 15.00
Choice No. 1 R. R. Wrought.....	15.00 to 15.50
Machinery Cast.....	15.00 to 15.50
Wrought Iron Pipe.....	11.50 to 12.00
No. 1 Forge Fire Scrap.....	11.50 to 12.00
No. 2 Light Iron.....	9.00 to 10.00
Wrought Turnings.....	8.75 to 9.25
Stove Plate.....	11.00 to 11.50
Cast Borings.....	7.50 to 8.00
Grate Bars.....	11.75 to 12.25

St. Louis.

St. Louis, Mo., April 20, 1908.

A meeting of members of the Merchants' Exchange will be held April 21, for the purpose of promoting the movement to inaugurate the resumption of traffic on the Mississippi River between St. Louis and New Orleans. It is proposed to establish a line consisting of 30 steel barges and four towboats. The proposition involves the raising of \$2,000,000. Certain St. Louis parties about a year ago took out a charter for the Grain Growers-Exporters Transportation Company, to serve as a nucleus for the barge project. It is a Missouri corporation, with \$50,000 authorized capital.

Old Material.—There is some improvement in the demand for Old Material and prices on certain classes are stronger to a trifle higher. There is quite a demand springing up for Relaying Rails, doubtless owing to some railroads being in better financial position and resuming the building of track, but desire to purchase as economically as possible. We quote as follows, f.o.b. St. Louis, per gross ton:

Old Steel Rails.....	\$11.00 to \$11.50
Old Steel Rails, rerolling.....	11.00 to 11.50
Old Steel Rails, less than 3 ft.....	11.00
Relaying Rails, standard sections, subject to inspection.....	22.00 to 23.00
Old Car Wheels.....	14.50 to 15.00
Heavy Melting Steel Scrap.....	11.50
Frogs, Switches and Guards, cut apart.....	11.50
Mixed Steel.....	10.50

Following quotations are per net ton:

Iron Fish Plates.....	\$12.50
Iron Car Axles.....	16.50
No. 1 Railroad Wrought.....	\$11.50 to 12.00
No. 2 Railroad Wrought.....	10.50 to 11.00
Railway Springs.....	11.00
Locomotive Tires, smooth.....	13.00
No. 1 Dealers' Forge, nominal.....	9.00 to 10.00
Mixed Borings, &c.....	4.00 to 5.00
No. 1 Boiler, cut to Sheets and Rings.....	8.50
No. 1 Cast Scrap.....	12.00
Stove Plate and Light Cast Scrap.....	10.50
Railroad Malleable.....	10.00
Agricultural Malleable.....	9.00
Pipes and Flues.....	8.00 to 8.50

Metal Market.

NEW YORK, April 22, 1908.

Pig Tin.—The dullness in trade which characterized the report of last week continued during the week under review. Consumers apparently need little, and this, with the closing of the London Exchange, made business exceedingly dull. Fluctuations during the week have been within narrow limits, and sharp competition has ensued for any business offering. The range of prices during the week has been as follows:

	Cents.
April 15.....	31.95 to 32.00
April 16.....	31.90
April 17.....	31.90
April 20.....	31.95
April 21.....	31.90
April 22.....	31.70

Some little pressure was observed in the selling of Minne-haha Tin, as over 900 tons arrived on this steamer yesterday. This business was taken on an average of 15 to 20 points below the spot market. Gossip from London is to the effect that one of the leading bull operators is actively manipulating the market, and reports are that Tin is to be put up considerably. It is a fact that with all the world-wide liquidation and prices in many commodities cut in two, Tin is now ruling at a higher figure than at any time previous to the latter part of 1905 and the two following years. Exception, however, must be taken to spasmodic advances above 32c., such as occurred in 1899 and 1900, but these were very short lived. The arrivals so far this month have been large, amounting to 2985 tons, and there are afloat for American ports 1481 tons. Price changes in London during the week have shown a decline of 15s., the London market closing to-day at £143 17s. 6d. for spot, and £142 15s. for futures.

Copper.—Despite falling quotations in London, and the absence of large business in this country, prices remain unusually stubborn. A careful search was made during the early part of the week for Electrolytic and nothing was found under 12.75c., net cash, New York City. Export orders could, of course, have been placed at slightly less. Lake is just as firm, at 13c., and Casting Grades at 12.62½c. The holidays in London put a damper on buying from that point as well as continental Europe, but purchases for foreign consumers seem to be going on steadily, although an absence of large speculative buying is noted. This may be expected to resume if prices should recede further. The exports continue to be the main stay of the market, and European consumers are taking liberal supplies, the exports so far this month amounting to 20,776 tons. This makes over 100,000 tons of Copper exported so far this year. If to this is added 100,000 tons exported during the last three months of 1907, it shows that in the short space of less than seven months over 200,000 tons of Copper have been exported. The highest exports heretofore were in the year 1904, when so much metal was sent to China, and slightly less than 250,000 tons was then exported. It should be recalled, too, that the supplies of Copper to American consumers are being cut down in another way; that is, imports since September have shown a marked falling off. The London market closes 10s. lower than last week, at £58 for spot, and £58 10s. for futures. The Boston & Montana smelter was saved from the flood last week, but transportation facilities and power supplies having been cut off ore will necessarily be diverted to the Washoe smelter.

Lead.—Prices continue firm, the American Smelting & Refining Company being the cheapest seller at 4c., New York. Lead can be had in St. Louis, at 3.85c.

Spelter.—Little or no change is observed in the price of Spelter, and business has been unusually light. Prime Western Brands are salable at 4.50c., St. Louis, and 4.65c., New York.

Nickel.—Prices are unchanged, at 45c., for ton lots, and 50c. to 60c. for smaller quantities.

Ferroalloys.—The demand from consumers continues light, much of their requirements being supplied through resale lots. When consumers, however, are in urgent need of prompt shipments they are compelled to pay about \$43.50 to \$44, seaboard, for Ferromanganese. Prices on 50 per cent. Ferrosilicon are more or less nominal, at \$80.

Old Metals.—Practically no change is observed either in prices or the volume of business. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy Cut and Crucible.....	12.25 to 12.50
Copper, Heavy and Wire.....	12.00 to 12.25
Copper, Light and Bottoms.....	11.25 to 11.50
Brass, Heavy.....	9.00 to 9.25
Brass, Light.....	7.25 to 7.50
Heavy Machine Composition.....	11.50 to 11.75
Clean Brass Turnings.....	8.25 to 8.50
Composition Turnings.....	9.00 to 10.00
Lead, Heavy.....	3.80
Lead, Tea.....	3.55
Zinc Scrap.....	3.50

Antimony.—Prices are largely nominal, Cookson's being quoted at 8.75c. to 9c., Hallett's at 8.75c., and outside brands at 8.50c.

Tin Plate.—While the booking of new contracts is not so active as a few weeks ago, still specifications on large

orders are coming in freely. Prices are steady, at \$3.89, New York, and \$3.70, Pittsburgh, for 100 IC Coke Plates. In Swansea business is active and Welsh Plates are unchanged, at 12s. 7½d.

New York.

NEW YORK, April 22, 1908.

Pig Iron.—At the meeting of the Eastern Pig Iron Association held last week, it was decided to maintain prices for the present, and one selling agency has withdrawn some of the lower figures quoted. The market, however, is dominated by the Southern makers, some of whom have sold at figures in this territory which are equivalent to \$11.75 for No. 2 at Birmingham. We quote at tidewater as follows: No. 1 Northern Foundry, \$18 to \$18.50; No. 2, Northern Foundry, \$17.25 to \$18.25; No. 2 Plain, \$17 to \$17.50; Alabama Irons are \$17.25 to \$17.50 for No. 1 Foundry and \$16 to \$16.50 for No. 2 Foundry.

Steel Rails.—The distribution of the 31,000 tons of rails bought for Vanderbilt lines, as announced last week, is as follows: Lake Shore & Michigan Southern, 20,000 tons; Michigan Central, 8000 tons; Chicago, Indiana & Southern, 2000 tons; Lake Erie & Western, 1000 tons. Scattering orders amounting to 2000 tons have been booked by one company.

Structural Material.—Some railroad bridge work has come out in the past week, but there are no large contracts. The St. Paul placed 700 tons with the American Bridge Company for its Pacific Coast extension; the Pennsylvania Railroad awarded 600 tons for bridges to the Pennsylvania Steel Company, and a contract for 500 tons is reported to have been let by the Boston Elevated. The Dock Department of the city of New York will open bids on May 7 for the Steel structural work at the Staten Island ferry terminal. In addition to the riveted Steel pipe line for which it has recently bought Steel, the Anglo-Newfoundland Development Company's improvements in Newfoundland call for 1500 tons of Structural material on which several local construction companies have figured recently. On a recent Brooklyn contract for a manufacturing plant for which Cast Iron columns are to be used, the fabricating work being of a simple character, a price of \$42 is said to have been made. The low prices persist, and it is becoming more apparent that the fabricating business will show a surplus of capacity for a long time to come. The extent to which some of the smaller concerns have loaded up on profitless contracts is commented on. The general feeling is still rather hopeful, in view of the increasing tonnage of new work that is being figured on, but the work actually in hand is more and more in contrast with conditions a year ago. We continue to quote as follows on mill shipments, f.o.b. tidewater: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—The Eastern Bar Iron manufacturers held their usual monthly meeting in this city last week and unanimously decided to maintain prices at 1.50c., Pittsburgh, or 1.66c., New York. It is stated that consumers requiring a full range of sizes or who desire Bars made by mills of good standing are placing some orders at these rates. The volume of business, however, is quite small and most of it is still being taken by jobbers or brokers who have lower priced Iron purchased some time ago, which they are selling at about 1.50c., New York. It is claimed that the quantity of Bar Iron purchased in this locality when prices were demoralized was not large, and the fact that some of it is still to be had shows how limited the demand has been. Steel Bars continue unchanged at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—The largest order recently taken by Eastern sales agents was for export to Newfoundland, and comprised about 2000 tons, to be used in the construction of a Pipe line connected with a pulp works. While current business is usually confined to lots of the size of a carload and a little larger, more figuring is now being done than for some time, and prospects are growing a little brighter. It is stated that the Steel Pipe line required for the extension to the Brooklyn Water Works, which will require about 20,000 tons of Plates, will certainly come in the market within the next two months. Prices are maintained, as follows, on standard sizes of Plates, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Some lettings are now being made by municipalities in Pennsylvania, but these usually do not call for a definite quantity of Pipe, but are for the season's requirements. Outside of business of this character, little is now being done. Local sales are confined to an occasional carload. The city of New York is expected to be in the market next week for 1500 to 2000 tons. Quotations on carload lots of 6 in. are continued, at \$24.50 to \$25, per net ton, at tidewater.

Old Material.—The market is almost lifeless. Foundries are buying sparingly, being able to supply their requirements for Pig Iron at such reasonable prices that they are using probably less than the normal mixture of Scrap. Rolling mills are only running spasmodically and appear to be able to purchase the small supply of Old Material needed directly from the railroad companies at lower prices than dealers are willing to name. The Steel works are running to so low a percentage of their capacity that when they purchase a few thousand tons of Scrap they retire from the market for some considerable time. Accumulations of stock are noted in some lines, especially in Old Car Wheels, which now are completely neglected. Quotations are continued, as they represent about what consumers would be obliged to pay if they were purchasing from dealers. We quote as follows, per gross ton, New York City:

Old Girder and T Rails for melting.....	\$9.50 to \$10.50
Heavy Melting Steel Scrap.....	9.50 to 10.50
Old Steel Rails, rerolling lengths.....	10.50 to 11.50
Relaying Rails.....	19.00 to 20.00
Old Iron Rails.....	14.00 to 15.00
Standard Hammered Iron Car Axles.....	16.00 to 17.00
Old Steel Car Axles.....	14.00 to 14.50
No. 1 Railroad Wrought.....	11.50 to 12.50
Iron Track Scrap.....	9.50 to 10.50
No. 1 Yard Wrought, long.....	10.50 to 11.50
No. 1 Yard Wrought, short.....	9.50 to 10.50
Light Iron.....	5.00 to 6.00
Cast Borings.....	4.50 to 5.50
Wrought Turnings.....	6.00 to 7.00
Wrought Pipe.....	9.00 to 10.00
Old Car Wheels.....	14.00 to 15.00
No. 1 Heavy Cast, broken up.....	13.00 to 14.00
Stove Plate.....	9.00 to 10.00
Locomotive Grate Bars.....	9.50 to 10.50
Malleable Cast.....	10.00 to 11.00

The offices of Rogers, Brown & Co., pig iron merchants, have been removed from the Trinity Building to the Hudson Terminal Building, 30 Church street, New York.

Iron and Industrial Stocks.

NEW YORK, April 22, 1908.

The period covered since our last report has been broken by two holidays, so that transactions have been much smaller than usual. The market, however, has been fairly firm, notwithstanding some adverse influences, such as the beginning of a gold exporting movement. Republic prices were particularly affected on Monday and Tuesday by reports regarding the possibility of the passing of the preferred dividend. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 33¼ to 35¾, preferred 98¼ to 99¾; Car & Foundry common 32 to 33¼, preferred 92½; Locomotive common 44¼ to 45¾, preferred 92 to 94½; Steel Foundries common 6 to 6½, preferred 30½ to 31; Cambria Steel 29 to 29½; Colorado Fuel 23¼ to 24¾; Crucible Steel common 5, preferred 37¼; Pressed Steel common 23½ to 24¼, preferred 77½ to 78½; Railway Spring common 33; Republic common 16¼ to 18, preferred 64 to 68¾; Sloss-Sheffield common 43 to 44½; Cast Iron Pipe common 24, preferred 69½ to 70; Can common 4¾ to 5, preferred 51 to 51½. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 35¾, preferred 99¼, bonds 97¾; Car & Foundry common 33, preferred 93½; Locomotive common 45¾, preferred 94¾; Colorado Fuel 24¼; Pressed Steel common 24¾, preferred 78½; Railway Spring common 33½; Republic common 16¾, preferred 66¾; Sloss-Sheffield common 43; Can common 4¾, preferred 51.

Of the outstanding 6 per cent. bonds of the Wellman-Seaver-Morgan Company, Cleveland, Ohio, the balance of \$43,000 has been called for payment at 105 and interest on May 1. The new issue of 5½ per cent. bonds, dated September 15, 1905, of which \$920,000 is outstanding, matures at the rate of \$40,000 every six months.

The Ingersoll-Rand Company.—The annual report of this company for the year ended December 31, 1907, shows net earnings of \$1,788,601, an increase of \$149,664, and a final surplus of \$458,880, an increase of \$174,551. The detailed income account shows the following changes:

	1907.	Changes.
Net earnings.....	\$1,788,601	Inc. \$149,664
Depreciation.....	433,983	Inc. 64,276
Net for year.....	\$1,354,618	Inc. \$85,388
Interest on bonds.....	100,000
Balance.....	\$1,254,618	Inc. \$85,388
Preferred dividend.....	285,738	Inc. 15,837
Surplus.....	\$968,880	Inc. \$69,551
Special reserve for patents, licenses, inventories, &c.....	*510,000	Dec. 105,000
Net surplus.....	\$458,880	Inc. \$174,551
Previous surplus.....	461,752	Inc. 284,329
P. and L. surplus.....	\$920,632	Inc. \$458,880

* Includes special inventory reserve of \$500,000.

The surplus after preferred dividends, \$968,880, before

charging off special reserves for patents, licenses and inventories, is equal to 32.27 per cent. earned on the \$3,000,000 common stock. Charging surplus with the \$510,000 so reserved, the surplus, \$458,880, would be equal to 15.27 per cent. on the common stock.

Dividends.—The United States Cast Iron Pipe & Foundry Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable June 1.

The Pennsylvania Steel Company has declared a semi-annual dividend of 3½ per cent. on the preferred stock, payable May 1.

Proposed International Beam Agreement.—The effort recently made to bring together the structural steel manufacturers of Great Britain, Germany and Belgium has had no definite outcome as yet, though it is stated the negotiations are still under way. The German Steel Syndicate is understood to have taken the initiative and a meeting was held in London. It is stated that the position of Great Britain is rather more favorable in the international beam trade. Its imports were 88,905 tons last year, as against 136,660 tons in 1906. Belgium shipped 92,000 tons into Great Britain in 1906, but only 53,400 tons in 1907. The exports from Great Britain were 106,353 tons in 1907 and 107,115 tons in 1906, showing a considerable advance from the record of 63,965 tons in 1905.

The New England Foundrymen's Association.—At the April meeting of this society, held at the Exchange Club, Boston, a resolution was adopted that the association should unite with the New England Stove Manufacturers' Association in adopting a uniform form of contract for purchasing pig iron, as read to the meeting. The death of Patrick Shields, Shields Foundry Company, Mansfield, Mass., was reported, and a committee was appointed to prepare resolutions. T. E. Byrnes, vice-president of the New York, New Haven & Hartford Railroad, gave an interesting talk on the transportation needs of New England.

The Pennsylvania Engineering Works, New Castle, Pa., has lately moved into its new office building adjoining the plant, and now has the necessary room to carry on its business. The building is two stories high, but is intended for future extension, as heavy walls have been provided on which another story can be added at some future time. The first floor is used for offices of the management and general and bookkeeping departments, while the second floor is occupied by the drafting and estimating departments. The building is built of steel, brick and fire-proof material, has electric lights and is steam heated. The basement and both floors have each its own fireproof vault for storing records, tracings and blue prints. The building is handsomely furnished and is connected to the plant by a small bridge. This company recently completed the erection of a new blast furnace for the Wisconsin Steel Company, South Chicago, Ill. Deliveries have been started on an order from the Indiana Steel Company for 30 90-ton ladles and 30 40-ton hot metal cars for shipment to Gary, Ind.

An interesting diagram has been issued by John Birkinbine, consulting engineer of Philadelphia, representing graphically the relations for a series of years between the population, the currency circulation and the pig iron production of the United States. The record for 18 years, as indicated by the diagram, shows that while the population of the United States augmented 36 per cent., the domestic pig iron output was almost trebled, the per capita production doubled, and with the available currency per inhabitant expanded 41 per cent., the pig iron industry apparently demanded in 1907 nearly two and one-half times as much money as in 1890.

The Mesta Machine Company, Pittsburgh, is making this week shipment of a 32 and 56 x 50 in. twin tandem compound reversing engine, the approximate weight being about 800,000 lb., to the Bethlehem Steel Company, South Bethlehem, Pa. It is intended to drive the 28-in. structural mill. The Mesta Machine Company is also building at its works at West Homestead two high pressure and two low pressure long cross head vertical engines, high pressure cylinders 44 and 84 x 60 in., and low pressure cylinders 84 and 84 x 60 in., for the Cleveland Furnace Company, Cleveland, Ohio.

The Ferroalloy Duty.

Another chapter in the long drawn out controversy between importers and the Government regarding the classification to be accorded ferrochrome, ferrotungsten and ferrovanadium was written April 16, when the Board of United States General Appraisers made a new decision on the subject. The ferro issue has engaged the attention of both the Board of Appraisers and of the Federal courts for several years. Throughout the various suits the Government has maintained that the ferros are dutiable properly at the rate of 20 per cent. under the provision for "metallic mineral substances in a crude state, and metals unwrought." On the other hand, the importers contend that the ferros are entitled to assessment at the rate of \$4 per ton under paragraph 122, by similitude to ferromanganese.

General Appraiser Fischer, who writes the latest decision for the lower customs tribunal, takes notice of the fact that the United States Circuit Courts of Appeals, both at New York and at Philadelphia, have passed upon the question at issue. Unfortunately for the termination of litigation the decisions of the two courts were conflicting. Under these circumstances it was decided to bring a new case before the board, and on a more complete record carry the issue into the courts for final determination.

In the earlier proceedings standing in the name of the Roessler & Hasslacher Chemical Company, the Circuit Court of Appeals for this circuit upheld the contention of the importers. Under that ruling, the court held that ferros are not capable of being wrought, and limited the application of the provision for "metals unwrought," to such metals as are susceptible of being wrought. The opinion in that case referred to ferros as substances fit merely to be thrown into the crucible to be melted up with other ingredients to produce another and distinct product. The decision excluded such substances from the provision for unwrought metals and held them to be dutiable by similitude to ferromanganese. Just the opposite conclusion was reached by the Appellate Court in Philadelphia, when a protest of the William Cramp & Sons Shipbuilding & Engine Company was under consideration. This decision held the ferros to be "metals unwrought," as alleged by the Government.

Acting on the basis of a more complete record in the latest case, the Board of Appraisers now overrules the claim of the importers in the present case, which stands in the name of E. J. Lavino & Co. and others of New York and Philadelphia, including the Midvale Steel Company. The effect of the board's ruling is to indorse the decision arrived at by the Philadelphia Appellate Court in the Cramp case. As the issue now stands, the Government is the victor, although it is understood that the importers will appeal to the courts, where a strong fight will be made in behalf of the lower duty. In finding against the importers, General Appraiser Fischer says in part:

The illustrative exhibits demonstrate that these ferroalloys, though they may be imported to be used merely as substances to be melted up with other materials in a crucible in the manufacture of certain kinds of steel, are nevertheless not incapable of use otherwise. They may be wrought, and the proof presented indicates that they may have been used for practical purposes as metal. Witness Heany testified that he has used the various ferroalloys in making electrodes, resistance wire, and in the manufacture of utensils which he uses in the manufacture of tungsten filaments for electric incandescent lighting. These ferros are imported in their crudest form, and we hold, following the Cramp case, that they are within the provision for "metals unwrought," as that term is used in paragraph 183 of the tariff.

Founders' Day exercises at the Carnegie Institute, Pittsburgh, will be held on April 30 this year. Ambassador Bryce will speak on the subject of "The Influence of Modern Science Upon Modern Thought." W. T. Hornaday, the eminent naturalist, will make an address on "The Educational Value of a Popular Museum," while Henry E. Krehbiel, the musical critic of the New York *Tribune*, will talk on the subject of "The Orchestra as a Teacher of Music." It is not expected that Andrew Carnegie will attend the exercises this year.

The Machinery Trade.

NEW YORK, April 22, 1908.

The machinery trade is watching the railroads for lists and it is thought that it will not be long before the Eastern trade will get some business from that source. The Western railroads have been buying liberally of late, and the Chicago, Milwaukee & St. Paul Railroad, particularly, has been a heavy purchaser. Men who watch the railroad purchasing departments and operating departments closely say that there are many freight cars which were used a great deal during the good trade of last year which are in urgent need of repairs, and it is thought that it will be but a short time until a number of shops in the East which are inadequately equipped for this work will be put in shape, and the result will be some fair lists of machine tools for the trade to bid on. Generally speaking, the last week has not been a discouraging one to the New York machinery trade, as there has been some fairly steady buying, not in large lots, but the result of the week's sales with most of the houses was nothing to complain of considering present conditions. The Standard Oil Company is still buying for its Bayway plant, and an order was placed last week with the Vandyck-Churchill Company for 18 jib cranes, and some orders for other conveying equipment, it was understood, were placed with other houses. The New York Central Railroad has been buying somewhat more briskly than for a number of weeks, and although no lists were sent out a fair quantity of business was placed in scattered orders with a number of firms. The trade in second-hand machinery has been dull and manufacturers of steel castings have not been particularly successful for getting long time contracts for machine castings with the trade in general.

The R. W. Herfurth Company, 39 Cortlandt street, New York, has been incorporated with an authorized capital of \$125,000 to manufacture metal working machinery and to do a general business as a machinery dealing firm. The company will spend about \$30,000 in fitting up a plant in Jersey City, and some machinery equipment will be purchased. The buying will include machine tools and power equipment to develop about 60,000 hp., besides some machine tools and other general manufacturing equipment. It has not been decided whether gas or electricity will be used for power. The machinery the company will manufacture will be made from patents formerly owned by R. W. Herfurth, who has turned them over to the company. Besides operating a plant in Jersey City the company will have storehouses and offices in Hartford and Philadelphia which will be used for storing and marketing not only the company's product, but a general line of machinery equipment. R. W. Herfurth is president and general manager of the company, and he and George Surand and Benjamin S. Morehouse are the incorporators. It is understood that the purchasing of the machinery required for the Jersey City plant will be begun in about 60 days.

A number of inquiries placed in the market lately indicate that the Corn Products Company intends doing some buying in New York for its new plant at Summit, Ill., which is now in course of construction. The company is building an unusually large plant, comprising about 33 buildings, ranging in height from 1½ to 14 stories, and, although some large orders have been placed in the West for equipment for the plant, it is not thought that the buying has by any means been completed. It is understood that great progress has been made in the construction of the plant, and it is expected that it will be in operation before the year is out.

The C. I. F. Company, 11 Broadway, New York, has received the following inquiries from foreign sources on which it will be pleased to receive specifications, prices and other information: Inquiry No. 51, machines for making duplex steam pumps, for boring, facing, drilling, milling, &c.; inquiry No. 52, drawing and stamping press, power driven, to stamp 20 gauge sheet copper, with suggestions as to annealing of material prior to drawing, prevention of crimping, &c.; inquiry No. 53, brass foundry equipment for making brass fittings, core making machines, molding machines, &c.; inquiry No. 54, machine tools for working brass; inquiry No. 55, milling and grinding machine for making dies in sectional form for punching out segments for electric work; inquiry No. 56, woodworking machinery.

The Brooklyn Union Gas Company, 180 Remsen street, Brooklyn, N. Y., will probably need some machinery equipment for a new plant to be erected in Brooklyn for manufacturing and repairing gas meters. The structure will be 75 x 100 ft. in size, two stories in height and contract for the construction of the buildings has been let to Richard Deeves & Son, 305 Broadway, New York. The construction of the building will be superintended by W. C. Lane.

Business Changes.

The new Hudson Terminal Buildings have been opened and many tenants are moving in. Among them are the following firms engaged in the machinery trade and allied

industries: At 30 Church street: Adams & Westlake Company, American Brake Shoe & Foundry Company, American Bridge Company, of New York, American Gas & Electric Company, American Locomotive Company, American Steel Foundries, Atlas Engine Works, Ball & Wood Company, Bookelman Construction Company, Carbon Steel Company, Cleveland Varnish Company, Cockburn Barrow & Machine Company, Crocker-Wheeler Company, Charles Engelhard, Fairbanks, Morse & Co., Fort Wayne Electric Works, Alfred Fowle, Jr., commissioner for valve and fitting manufacturers and malleable iron fitting manufacturers; General Electric Company, Godwin Construction Company, Jacobs & Davies, Keystone Seal & Press Company, H. G. Kotten & Co., Lambert Hoisting Engine Company, J. J. McCabe, Monarch Machinery Company, Monarch Ventilator Company, Nelson Valve Company, Ohio Brass Company, Railroad Supply Company, Railway Steel Spring Company, Robins Conveying Belt Company, Rogers, Brown & Co., Tonopah Extension Mining Company, Tuohy Bros. Company. At 50 Church street: Abendroth & Root Mfg. Company, Ajax Mfg. Company, American Clay Machinery Company, American Diamond Blast Company, American Machinery & Export Company, American Mason Safety Tread Company, American Spiral Pipe Works, American Steam Users Economic Company, Brown Hoisting Machinery Company, W. H. Bundy Recording Company, H. W. Caldwell & Son Company, Ralph B. Carter Company, H. M. & H. F. Chase, Chicago Pneumatic Tool Company, Composite Board Company, Conolly Iron Sponge & Governor Company, Connersville Blower Company, Consolidated Railway & Light Company, Crown Castings Company, Cutler-Hammer Mfg. Company, Davies & Thomas Company, Dayton Hydraulic Machinery Company, Electric Controller & Supply Company, Electric Service Supplies Company, Emerson Electric Mfg. Company, Exeter Machine Works, Walter H. Foster Company, A. N. Frecker, Fromme Bros., E. G. Gautier & Co., General Contracting & Engineering Company, Harper Machinery Company, Harris Automatic Press Company, Independent Engineering Company, International Auxiliary Company, Interstate Engineering Company, David Lupton's Sons Company, Machinery Club of New York, McIntosh, Seymour & Co., Mesta Machine Company, Morse Chain Company, Thornton N. Motley & Co., Oliver Machinery Company, Ephraim S. Pease, Providence Engineering Works, Riter-Conley Mfg. Company, Rust Boiler Company, Schoen Steel Wheel Company, Schutte & Koerting Company, Security Register & Mfg. Company, Sherwin-Williams Company, H. B. Smith Machine Company, Star Engineering Company, Tyler Tube & Pipe Company, Wagner Electrical Mfg. Company, Watson-Stillman Company, Wellman-Seaver-Morgan Company, Wendell & MacDuffie, Western Wheeled Scraper Company.

In order to more fully designate the name of its products, the General Pneumatic Tool Company, Montour Falls, N. Y., changed its name May 18 to the Shepard Electric Crane & Hoist Company. The company, which manufactures Shepard electric traveling cranes, electric hoists, pneumatic hoists and riveters, is at the present time producing more than 200 distinct types and sizes of electric hoists, in capacities ranging from ½ to 20 tons, for practically every variety of service. On April 22 the New York office was moved from the Singer Building to more desirable quarters in the Fulton Building, Hudson Terminal.

The executive offices of the Westinghouse Electric & Mfg. Company, formerly at 111 Broadway, New York, and its New York sales offices and export offices, at 11 Pine street, were removed on Monday to the new City Investing Building, 165 Broadway, New York.

Chicago Machinery Market.

CHICAGO, ILL., April 21, 1908.

Business for the past week in machinery lines has developed a moderate amount of routine orders which continue to be individually small, yet are on the whole quite acceptable at the present time. Indeed, if business of this character were large enough to swell the volume to normal proportions it would prove more desirable and profitable than the larger orders for extensive equipment which, in times of active buying, comprise the requirements of more important industries. The attention of the machinery trade is generally centered upon Western territory, which continues to supply the bulk of the miscellaneous orders now coming into the market. Reports of salesmen returning from Western trips agree in the statement that the small shops and factories throughout the territory embraced in the Mississippi and Missouri River valleys, supplying trade supported by the agricultural interests, are nearly all doing close to a normal business. This, of course, does not include any of the larger manufacturing plants, which are dependent directly or indirectly upon the railroads for the consumption of their product. Outside of the Chicago, Milwaukee & St. Paul Railway,

which has not diminished its activity in the construction and equipment of its Pacific Coast extension, the railroads are not at present an important factor in the machinery market. At the same time, it is to be borne in mind that instead of making lump purchases of a lot of tools at one time, as has been their custom, the railroads are buying a few tools here and there from month to month as necessity demands; and their purchases being scattered in this way perhaps aggregate more than is realized from a cursory view of the situation. There is a fairly good demand for pneumatic tools, which has been reinforced by some late export orders of fair size. Among recent domestic sales reported was one including a number of tools furnished to a large pressed steel car works. The nature of the tools ordered indicated that they were required for use in connection with passenger car construction, and it is presumed that some important contracts of this nature have either been secured or are in sight. As a result of the extensive and growing development of hydro-electric power plants in the West, it is noticed that electricity is playing a more and more important part in the motive power of mining machinery and apparatus. Electrically driven drills, for instance, are growing in favor where such power is available, and the use of motors and other electrical machinery is being extended in mining fields.

The Chicago, Milwaukee & St. Paul Railway Company, Chicago, has issued the following list of miscellaneous tools and equipment on which the trade is now submitting bids. This list is supplemented to one recently submitted, which was published in these columns on March 26, and is also designed for the equipment of shops along the line of the new Pacific Coast extension:

One 5 x 6 x 10 ft. vacuum pump; one 500-hp. open feed water heater; one 500-ton hydraulic wheel press; one 30-in. turret head boring and turning mill; one 24 in. x 24 in. x 6 ft. planer; one planer vise 12-in. jaws; one 48 in. x 48 in. x 16 ft. planer; one planer vise 24-in. jaws; one 72-in. vertical boring and turning mill; one Yankee style "F" wet twist drill grinder; two wet emery wheel grinders; one 18-in. slotting machine; one heavy double axle lathe; one independent feed four-spindle drill; one 42-in. steel tired car wheel lathe; one 78-in. guide bar grinder; one 8-ft. full universal radial drill press; one 20-in. back geared drill press; one 52-in. heavy car wheel boring machine; one 42-in. triple geared engine lathe; one 4-jawed 30 in. diameter chuck for above lathe; one 18 in. x 12 ft. double head back geared shaper; one locomotive cylinder boring bar; one 24-in. quick change gear lathe; one 1½-in. 6-spindle nut tapping machine; one 3 x 26 in. flat turret lathe, belt driven; one flue welder; one 6-spindle independent feed drill; one double punch and shears with 36-in. throat; one single punch with 42-in. throat; one power plate bend rolls; one 100-lb. helve hammer; two 1600-lb. single frame hammers, cylinders 13 x 33 in.; one 2½-in. heading and forging machine; one single bolt and bar shear; one sash and door tenoning machine; one 30-in. automatic knife grinder; one large car rip saw table to take up to a 36-in. saw; one 42-in. wheel band saw; one 4-spindle horizontal boring machine; one sash mortiser with boring attachment; one small iron frame rip saw; one No. 15 extra range heavy vertical hollow chisel mortiser with 2 H. C. universal boring attachments; one solid frame variety woodworker, 12-in. planing head; one heavy automatic cutoff saw; one 12 in. x 24 in. planer matcher and size complete; one small double spindle shaper, spindles 24 in. apart; one surface planer to cut 30 in. wide; one wood turning lathe, 16-in. swing.

The Steidle Turret Machine Company, Madison, Wis., has increased its capital stock from \$60,000 to \$100,000, and has added two new members to its Board of Directors, increasing the number from three to five. In pursuance of this action, the capacity of the present plant will be enlarged and important additions will be made to its equipment of machine tools. The company builds heavy turret lathes, its particular lines being the design known as the full swing side carriage turret lathe, which was originated and developed by G. A. Steidle. Its distinctive feature is the increased swing provided in front of the carriage tools, permitting the use of short tools on the turret, and thus shortening the leverage so that the chattering effect incident to the use of broad shaving turret tools is obviated. No change has been made in the personnel of the company, the officers being G. A. Steidle, president; Wm. R. Bagley, vice-president; J. A. Steidle, treasurer; A. M. Bagley, secretary.

The St. Paul Union Stock Yards Company, South St. Paul, Minn., has under consideration a plan for converting its 110-volt system into a 220-volt system, which if carried out will include the purchase of a 50-kw. engine generator unit; a 60-kw. belted unit, together with motors, switchboards and other necessary apparatus, including a centrifugal pumping plant. While the contemplated changes will probably be made, no definite action has yet been taken.

The city of Liberty, Ind., desires the substitution of electricity for the present gas system of street lighting, and wishes to communicate with some persons or company willing to install such a plant and furnish lights. G. E. Stevenson is chairman of the Light Committee.

The Allis-Chalmers Company of Milwaukee has received orders for two high pressure and one low pressure blowing

engines from the Wickwire Steel Company, Buffalo, N. Y. They are of the standard vertical long crosshead type.

The Western Engineers' Supply Company, M. J. Tearney, manager, and the Comet Motor Works, have removed from 47 South Canal street to the corner of Madison and Canal streets, where they will jointly occupy the storeroom, 72-74 South Canal street. The former concern carries a line of engineers' supplies and manufacturers' vertical steel tubular house heating boilers; the latter builds Comet gasoline motor boat engines.

Cleveland Machinery Market.

CLEVELAND, OHIO, April 21, 1908.

The local machine tool market is still very quiet, although some of the dealers report a slight improvement in orders and inquiries. While conditions show very little change, the indications are that the aggregate volume of business during April will slightly exceed that of March. The buying, as it has been since the first of the year, is mostly in small single tools, although occasionally a dealer gets an order for three or four tools. The buying is nearly all for small manufacturing plants or for new enterprises that are starting up but need very few tools. During the past week, however, some inquiries have come in from large factories that are planning the overhauling of their plants and the putting in of more modern equipment. Dealers report some improvement in the demand for mill supplies.

A large quantity of second-hand tools is still being offered to dealers, but they are buying used tools only when they can secure them at fairly low prices. The demand for second-hand tools seems to have fallen off somewhat, the majority of the inquiries now being for new tools.

Manufacturers of some lines of machinery report considerable improvement in orders and inquiries. This cannot be said, however, of the makers of machine tools, with whom conditions are about stationary.

One large crane builder in this territory reports an improvement in the demand for electric cranes, having taken orders for 14 large cranes in one week, 12 of which were for new steel making plants. The demand for locomotive cranes from industrial plants has improved, but orders from railroads are still very scarce. Although there are some reports of price cutting on locomotive cranes, prices are being quite well maintained.

The demand for electrical machinery is light, orders being mostly for small units. There is an improvement in inquiries for heavy power equipment and the outlook is more favorable. Makers of twist drills and kindred products report a gradual improvement in orders. Plants making sheet metal products are well filled with orders, and there is a fair demand for stamping machinery and presses for sheet metal work and specialties.

Pattern makers report a good demand for stove, automobile and machinery patterns, although in the case of machine patterns builders are going slow and it often takes some time before inquiries materialize into orders.

The Service Pump Company, Canton, Ohio, which has been incorporated with a capitalization of \$25,000, announces that it will equip a plant modern in every detail, in which it will make a new and improved straight line duplex steam pump, pneumatic pumps and controllers for all other makes of air pumps. The company is now looking for a site. The company has effected its organization by the election of the following officers: Elias W. Conkell, president; Andrew Hinten, vice-president; John C. Hermann, secretary and treasurer. The officers and William Berg, E. A. Kaufman, J. J. Hein and Dr. J. H. Beatty comprise the Board of Directors.

The Browning Engineering Company, Cleveland, reports considerable improvement in the demand for locomotive cranes. The volume of the company's business last month was 70 per cent. of normal, and a further improvement is expected this month. While few orders are being received from railroads, the company is finding a fair outlet for its cranes among industrial concerns.

The plant of the Sandusky Grille & Mfg. Company, Sandusky, Ohio, will be offered at public sale on April 25 by Vern K. McBride, trustee in bankruptcy. In addition to the buildings there will be sold the personal effects of the company, consisting of line shafting, planers, lathes and about 150 woodworking tools.

With its old work and new orders recently taken the Alliance Machine Company, Alliance, Ohio, still has enough work on hand to keep its plant running at full capacity night and day.

The W. Pattison Supply Company, Cleveland, has purchased the machinery equipment of the Universal Steel Wheel Company, Toledo, which has gone out of business. The outfit consists of lathes, drill presses, power presses, shapers and milling machines.

The Forest City Railway Company, Cleveland, will add to its power plant equipment and has purchased of the Norfolk & Portsmouth Street Railway Company, Norfolk, Va., three 22 x 24 x 48 Allis-Chalmers cross compound engines,

directly connected with 800-kw. General Electric generators.

Reports from Ashland, Ohio, state that F. E. Myers & Bro. of that city, makers of pumps, &c., have just received an export order amounting to \$40,000.

The Ravenna Furnace & Heating Company, Ravenna, Ohio, will erect a warehouse 60 x 80 ft. adjoining its plant. The plant is well filled with work and is running on full time.

The Cleveland Castings Pattern Company reports that it has been able to keep its plant running at full capacity all winter, and that orders are now coming in as fast as the work can be turned out. The orders include all kinds of patterns.

The C. O. Bartlett & Snow Company reports an improvement in the demand for coal handling and mill machinery. The company's plant is now running at 80 per cent. of its capacity, 10 hr. per day, and it is expected that it will soon be running at full capacity.

Cincinnati Machinery Market.

CINCINNATI, OHIO, April 21, 1908.

Extremely difficult is it at this time to estimate correctly, or, rather, justly, the market in machinery lines. For instance, the investigator encounters shops running practically on full time, with a complement of help, while across the street or in the next block is a concern which is almost totally shut down. Conditions appear to be governed by the general character of work manufactured. It is the special machinery men and makers of portable drills, small grinders and the like who are busiest and least feel the effects of the times; while with the makers of such tools as lathes, heavy drills, shapers and planers it is a case of wait, and meanwhile suffer a gradual reduction of forces and restriction of output. There is little, if any, improvement in the situation, taking the whole of it into consideration. Business comes in spurts, for with several large concerns in this district two days of last week furnished some nice business, a buying movement seemed imminent, but the prized third day failed to develop and things reverted to the monotonous grind of the times.

The European visitors, Alfred H. Schütte and his assistants, left the city on Thursday, having spent a delightful four days of sightseeing and renewing of old acquaintances. As far as can be ascertained they imparted nothing of importance to the general situation; they were not buying, being well stocked up at headquarters, and they seized upon the time to visit America because of the dullness at home, which permitted of their absence at this time. It is said that they felt the situation on futures and would have been pleased to make some new contracts at lower prices.

The local tool manufacturing interests keep fairly well apprised of conditions in this country, both in the extreme East and the extreme West, for representatives of the largest concerns have during the earlier months of the year visited their agents and the dealers in both sections, and estimated opportunities and conditions to a nicety. These do not feel any reason to hope for anything big or promising until after the Presidential election. There will be some excursions into trade territory of Latin America by the tool and general machinery manufacturers of this section some time in the fall, and preparations are already under way to this end. J. B. Doan, vice-president and general manager of the American Tool Works Company, will leave New York on the Mauretania on Wednesday morning for Europe, and will spend three months abroad taking careful note of conditions in all the European markets save Russia. European business, which has always been big with this locality, has fallen off to such a remarkable degree that it is believed that the depression which is felt so severely in this country has a serious reflection in Europe.

In second-hand machinery there is not the demand that might be expected at this time; some few sales are being made, but these are figured very closely. Dealers are offered some specially good bargains in used machinery, and these offerings have of late been in unusually large volume, from which it is argued that some manufacturers contemplate replacing with new machines and tools later on.

Inquiries of the banks develop the statement that there is plenty of money available at an average of about 5½ per cent. on approved security, but there does not seem to be any special need of financial assistance on the part of the machinery concerns; in other words, there are none seriously crippled by the trade depression, but there must be some sort of improvement soon, else the price cutting evil will have to be reckoned with. In fact, there is talk now of some shading of prices on tools for immediate delivery.

The foundries are not materially improving their melt. The sale of the Weber Foundry to Henry Weber, the original owner, at \$10,000 (his bid on the occasion of its offering at auction sale April 15), will come up before Referee Whitaker April 22. The upset price on the property is about \$17,000, and the Weber offer was so low that the trustee decided not to act without the authority of the special bankruptcy officer.

A new machinery enterprise for Sidney, Ohio, which city already has an almost international reputation for the number and prominence of its concerns manufacturing folding machines, is the Van Etten Machine Company, located at Fair avenue and Water street. It makes newspaper, job and pamphlet folders.

The Central Brass & Fixture Company is a new enterprise for Mechanicsburg, Ohio, which has just been incorporated for \$10,000, by D. S. Cramer, E. Horr, John M. Maddux, Joseph F. Mumma and E. L. Dyers.

The next meeting of the Manufacturers' Club of Cincinnati will be held May 11, at the Queen City Club. At the annual meeting and election April 15 C. R. Houston of the Houston, Stanwood & Gamble Company, Covington, Ky., was elected president, succeeding Harry T. Atkins; E. H. Hargrave of the Cincinnati Tool Company, first vice-president, and C. Gordon Neff of the Bradford Belting Company, second vice-president; W. F. Robertson of the Robertson Iron & Steel Company, treasurer, and Charles McFarland, secretary *pro tem*. Col. E. P. Wilson, who has handled the duties of the secretaryship for many years, is ill in Daytona, Fla.

Copies of the seventh annual report of the Industrial Bureau of Cincinnati, of which W. L. Finch is secretary and manager, are being mailed to members and interested parties. The text of this report, which was delivered by Secretary Finch at the annual dinner a few weeks ago at the Business Men's Club, contained such interesting and valuable data that many requests were received for copies, and the directors determined to have a large number printed for distribution. A recent achievement of the bureau, which is being generally complimented by the many interested, is the reception of a promise from President Kenan of the Cincinnati Gas Company that manufacturers are to have 30-cent gas within a year.

George K. Elliott, chief chemist of the Lunkenheimer Company, Cincinnati, delivered an address on "Metallurgical Considerations in the Manufacture of Steam Valves and Fittings" before the members of the Engineers' Club of Cincinnati on the evening of April 17.

At the annual meeting of the Buckeye Steel Castings Company, Columbus, O., April 10, the directors declared the regular quarterly dividend of 1½ per cent. on the preferred and 1 per cent. on the common stock. The directors authorized the erection of a modern pattern shop, which will be fully equipped with the latest machinery. Work on the new building, which will be after the general style of the company's present buildings, will be pushed to early completion. The company has at present one steel furnace in operation on double turn to take care of orders on hand.

It is stated that the largest consignment of machinery shipped by an Ohio concern for a number of years is that made up by the C. & G. Cooper Company, Mt. Vernon, for a wall paper manufacturing concern of London, England, and consisting mostly of engines. The shipment requires a 28-car train.

Congratulations are coming in from all directions to the Barney & Smith Car Company, Dayton, Ohio, which on April 10 celebrated in unique style. On that evening a banquet was tendered those employees who have been with the concern continuously for 25 years or more. One hundred and seventy-eight responded in this division, and, what is still more remarkable, the average length of time that these men had been with the company was a little more than 32 years. Two of those present had been with the company more than 50 years, one of them for 54 years. Of the number present 163 own their own homes. One of the most important facts brought out at the dinner was that in the 60 years in which the company has been building cars it had never had a strike.

The Capitol Commissioners at Frankfort, Ky., are considering plans for the erection and equipment of a new power house and other work for the State capitol buildings. Architect Frank M. Andrews, Dayton, Ohio, is in charge of the work.

The United States Tool Company, Vincennes, Ind., is now installed in the building formerly occupied by the Fyfield Woolen Mill Company on Barnett street, in that city, moving from the old plant of the Edgington Tool Company in North Vincennes. The company manufactures a variety of oil and gas drilling tools and will greatly enlarge its capacity.

E. E. Porter, Bellevue, Ohio, is interested in the promotion of a foundry company to operate in connection with the Runyan Company at Canal Dover, Ohio.

Joseph Goldberg, Crawfordsville, Ind., whose fertilizer factory was burned recently, has determined to rebuild at once with two large steel buildings, which will be equipped with the most modern machinery, including steam driers, tanks and boilers.

W. D. Garrett & Co., 136 Liberty street, New York, are the general Eastern agents of the Locke Regulator Company, Salem, Mass., manufacturer of Locke engine stop valves, damper regulators, pump governors, pressure reducing valves and underwriters' fire pump governor; Templeton Mfg. Company, Boston, Mass., manufacturer of Sterling

steam traps; Berry Engineering Company, Chester, Pa., manufacturer of Berry feed water regulators; Manzel Bros. Company, Buffalo, N. Y., manufacturer of Manzel automatic sight feed oil pumps; Sims Company, Erie, Pa., manufacturer of Sims boiler feed water heaters, steam separators, oil extractors, exhaust heads and oil filters. Garrett & Co. maintain a showroom wherein all of their specialties that are practical to exhibit are set up in working order for demonstration, which has the advantage of showing a prospective buyer the actual apparatus in operation.

Philadelphia Machinery Market.

PHILADELPHIA, PA., April 21, 1908.

Business in the local machinery market showed a slight recession during the past week. Buying appears to be somewhat irregular, the demand fluctuating from week to week. At times there will be a pretty fair buying movement on, when manufacturers will book orders for a few tools, and dealers will find it possible to close up a few of the pending inquiries. Such improvements in the demand seem to be followed by a week or two during which buying is almost at a standstill, and just about the time when the trade begins to feel that conditions look like continued inactivity a little business comes out and encourages them to greater effort, which usually results in more sales. Under existing general conditions no great improvement, however, is anticipated, and it is to be expected that buyers will make purchases, in many cases, only when they are actually compelled to do so. Some little business has developed from small plants, which have been recently established to make some of the smaller specialties, but no business worth speaking of has come from the medium or larger sized plants. The railroads show no disposition as yet to enter the market, particularly as regards machine tools. For maintenance of way purposes there has been a shade more buying, but nothing of any size has recently developed in motive power or rolling stock from the railroads in this territory.

The financial situation is better, but business fails to respond, and it is hardly anticipated that any real improvement will be noticeable until after the Presidential nominations are disposed of. In the meantime, it is believed, business will continue more or less irregular.

Inquiries during the week quieted down to some extent. New propositions requiring any extensive equipment are out of the market. The demand, which is largely of a day to day character, is confined almost entirely to single tool propositions. In nearly every instance tools inquired for are wanted for prompt shipment, and we learn of cases where both inquiries and the placing of orders have been deferred, even for new equipment, until the last possible moment.

Manufacturers report trade irregular. Some little improvement has been noted for some classes of tools, but not enough business has come out to increase working hours to any extent. A manufacturer of pneumatic tools, whose plant has been operating irregularly for some time, started in on full day turn last week, which, from present indications, is expected to be maintained for some time.

The export demand shows no improvement. Inquiry for the general line of tools is very quiet, although there has been a little scattered business offered in special equipment.

The second-hand machinery trade continues to transact a fair volume of business. In fact, there seems to be more activity in this line than for new tools. Sales of metal and wood working machinery of the medium classes are reported, but there is no particular activity in the demand for tools of the heavier classes. The second-hand boiler and engine trade is not active. There has been some demand for the medium powers, but nothing extensive has come out. Builders of the higher power engines report that inquiry is rather quiet, while they are rapidly catching up with the business on their books.

The foundry trades are dull. The absence of any material demand from the machinery and building trades is being felt, and foundries in most cases are not being operated much over one-third their capacities. Steel casting plants are running irregularly and find it next to impossible to book orders for forward delivery. The demand on the whole is largely of a day to day character, and some of the smaller jobbing foundries are dependent entirely on this class of business to enable them to run.

The Pottsville Union Traction Company has decided, it is understood, to construct a new bridge to replace the present bridge over the Philadelphia & Reading Railroad tracks in that city. Plans have been completed and await the approval of the borough engineer.

The Frankford Arsenal, Bridesburg, Philadelphia, will receive proposals until May 15, for supplies to be furnished during the fiscal year ending June 30, 1909. These include seamless copper tubing, iron and steel, tin, lead, zinc, anti-

mony, cartridge metals, electrical supplies, belting, tools and miscellaneous articles. Proposal forms and specifications, as well as general information regarding the materials and equipment desired, may be obtained from the commanding officer, Frankford Arsenal, Philadelphia.

Bids will be opened to-morrow by the Department of Public Works, city of Philadelphia, for five bridges, the estimated cost of which is \$230,000. At the same time bids for five concrete piers for the proposed Passayunk avenue bridge, over the Schuylkill River, will be opened. This work is expected to cost \$200,000. The list of bridges for which proposals will be opened is as follows: Rockland street over the Pennsylvania Railroad, Hunting Park avenue over the Philadelphia, Newton & New York Railroad, Ontario street over the Richmond branch of the Philadelphia & Reading Railroad and Sedgewick avenue over the Chestnut Hill branch of the Philadelphia & Reading. The Department is having plans completed for a number of additional bridges, and it is expected that the cost of work of this character, which will be contracted for in the next few months, will aggregate \$1,000,000.

E. Allen Wilson, architect and engineer, has completed plans for the building of a large factory building at Third and Spruce streets for Bayuk Brothers, cigar manufacturers. The building will measure 80 x 101 ft., and be five stories high, of the slow burning type of construction. It is understood that all the modern improvements in connection with the manufacture of cigars will be installed.

St. Louis Machinery Market.

ST. LOUIS, April 18, 1908.

The city of St. Louis advertises for proposals until May 1 for four 350-hp. boilers, with Roney mechanical stokers, Foster superheaters, settings, valves and other necessary fittings and breeching to the smoke flue of present stack at Boiler House No. 2, Bissell's Point.

The Meramec Portland Cement & Material Company, Bank of Commerce Building, is asking for proposals for machinery, structural steel and appliances for its new plant at Sherman, Mo. (near the city of St. Louis), among which are the following items: Kilns, dryers, tube mills, crushers, electric material, ball and tube mills, coal bunkers, coal conveying machinery, boilers, engines, pumps, structural work, shafting, pulleys, bearings &c.

The Heine Safety Boiler Company, Commonwealth Trust Building, reports the following boiler contracts recently entered on its books: N. K. Fairbanks Company, Chicago, one 500-hp.; Ashton Valve Company, Boston, one 150-hp. and one 75-hp. of 400-lb. working pressure for testing under steam pressure its steam gauge safety valves; Buffalo Water Works, four 618-hp.; Cambria Fuel Company, Cambria, Wyo., one 400-hp.; Citizens' Railway & Light Company, Fort Worth, Texas, two 366-hp.; city of Denton, Texas, one 290-hp.; Torresdale Filtration Plant, Philadelphia Water Works, six 327-hp.; Ebensburg, Pa., Light, Heat & Power Company, one 300-hp.; Mechanics' Art High School, Boston, three 142-hp.; General Roofing Company, East St. Louis, two 416-hp.; Heil Packing Company, St. Louis, two 206-hp.; new Soldan High School, St. Louis, three 250-hp.; Little Rock, Ark., Brewing & Ice Company, two 312-hp.; Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, two 448-hp.; Portland (Ore.) Iron Works, for U. S. dredgeboat, two 220-hp.; U. S. Post Office and Custom House, Cleveland, Ohio, three 250-hp.; U. S. Sugar & Land Company, Garden City, Kan., one 450-hp.; new Bank of Commerce Building, St. Louis, two 300-hp.; U. S. Navy Yard, Norfolk, Va., two 350-hp.; U. S. Navy Yard, Charleston, S. C., four 350-hp.; Keihan Electric Railway, Japan, two 300-hp.

Fairbanks, Morse & Co. state that during the past two months they have been enabled to keep the volume of their business well abreast of last year, owing to the excellent demand in particular for gas producers and producer gas engines, the sales of which have been made principally in the Southwest, for city plants and power plants. They have just installed three good sized plants in Texas to run on Texas lignite. Gas production is receiving growing attention on the part of engineers. In electrical machinery quite a satisfactory business has recently been done in St. Louis. It has been found in the oil producing sections of Kansas and Oklahoma that a product known as the first refining, costing less than 5 cents per gallon, can be used quite as economically as gasoline.

The N. O. Nelson Mfg. Company states that covering a period of the past four months it finds it has been doing about 75 per cent. as compared with the corresponding time last year. The fact, however, that its trade has not fallen off to the extent experienced by most concerns is doubtless largely owing to its having taken in more territory by establishing new branches, having last year opened up in Oakland, Cal., and the year previous in Los Angeles. The company is now arranging to remove its branch from Pueblo to Denver, Colo., and will largely increase the volume of goods carried in stock. Prices on its line average 20 per

cent. lower. In respect to tonnage, there is no falling off compared with last year. The company has secured the contract to furnish all the plumbing supplies for the new American Theatre and Hotel on Market and Seventh streets, and the new Third National Bank Office Building, Broadway and Olive street, and is furnishing some material for the new addition to the Bank of Commerce Building. The main contract for the latter building has not yet been let.

The Missouri Bridge & Iron Company, Chemical Building, states that its plant has been operating right along on full time, mostly on contract work.

H. S. Wells, secretary of the Otis Elevator Company, Security Building, states that business was quite good with the company during January and February, but is a little slack at present, most of the work being for comparatively small structures.

The city of Farmington, Mo., has just purchased an electric light plant of the Commercial Electric Company.

New England Machinery Market.

WORCESTER, MASS., April 21, 1908.

The Boston machinery dealers are philosophically accepting the condition of trade and by incessant work are making the most of the situation. In the aggregate a good many tools are being shipped. A large proportion of purchases are of second-hand machines, yet the total of new tools is worthy of consideration. Of course, orders are small, consisting of single machines, and not many of them are of the high priced variety. But, taken as a whole, business is rather better than it was earlier in the year. The railroads and other large customers are doing little buying. With the railroads curtailments of expenses promise unusually large expenditures for repair work later. The shops have been running with greatly reduced forces for some time, and necessary repairs have been avoided to such an extent that depreciation of rolling stock has been exceptionally rapid. The price for this condition must be paid later on, and the known inadequacy of the repair shops would seem to indicate that increased equipment will become an imperative necessity when railroad business shall revive. The railroad shop men agree as to this result of the policy which their companies have deemed best to follow.

The woodworking machinery trade reports a noticeable increase in business. One dealer reports the present month as at least equaling the corresponding period of 1907.

One of the great express companies is experiencing a marked increase in its volume of business as compared to the first quarter of the year. Some of its New England offices are nearly equaling their records of last year. In a few instances, notable among them Springfield, Mass., last week exceeded the same week of 1907. This is attributed partly to the increasing number of small shipments which go with buying in small lots instead of by carloads, but on the other hand, during the rush of a year ago a large tonnage of express business resulted from haste to make deliveries already long overdue. At any rate, the express company officials consider their increasing business to indicate a betterment in general trade conditions.

The consistent demand from the agricultural sections for all kinds of products, alluded to last week, has an interesting example in such concerns as the Farm Machinery Company, Bellows Falls, Vt., which is rushed to full capacity and has been hiring new men. Similar reports have been received from builders of agricultural tools and machinery all over the country.

A bill before the Massachusetts Legislature provides for an appropriation for the Lowell Textile School, Lowell, Mass., a portion of which will go for the equipment of a machine shop, should the bill become a law.

The American Locomotive Company has discontinued the building of locomotives at its Providence, R. I., plant, and has moved a large part of the machinery, distributing it among its other works. J. P. Williams, 811 Industrial Building, Providence, has purchased the best of the tools which were not moved, comprising about 10 carloads, and is placing them on the market.

Orrin S. Hammack & Co., pneumatic and electric tools and appliances, and the New England Supply Company, Wing's turbine fans, blowers and exhausters, have established offices in the Boston Machinery Exchange, Oliver Building.

The Armstrong Mfg. Company, Bridgeport, Conn., has brought out a new ratchet attachment which makes of the Armstrong stock a ratchet stock and die, and a new pipe cutter.

The Walton Company, Hartford, Conn., has been organized to manufacture small tools, and has purchased as a nucleus of its line, the extractor of broken taps manufactured by the Atlas Machine Company, Providence, R. I. A

factory has been established at 308 Pearl street. It is manufactured in sizes for taps ranging from No. 4 to 1½ in. Ward W. Jacobs is president of the company and Ward S. Jacobs treasurer.

The Hampden Machine Screw Company, Greenfield, Mass., which is to establish works for the manufacture of machine screw products, has secured an option on the automatic screw machinery of the F. E. Wells & Son Company, Greenfield. Space has been taken in the George M. Burnham factory on Arch street.

The business of the R. E. Colton Combination Tool Company, Easthampton, Mass., manufacturer of the Colton combination lathe, planer and shaper tools, will be enlarged to manufacture on an increased scale. A new corporation has been formed with a capital stock of \$50,000. R. E. Colton remains at the head of the business.

Government Purchases.

WASHINGTON, D. C., April 21, 1908.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until May 5 for three motors for the New Orleans Navy Yard, and until May 12 for four motor generators for the Puget Sound Navy Yard.

The Isthmian Canal Commission will shortly purchase a 1100-lb. steam hammer, 60-in. radial drill, 30 x 30 in. planer, 16 in. x 19 ft. engine lathe, 24 in. x 22 ft. engine lathe, double punch and shears with 36-in. throat, 24-in. crank shaper, 20-in. sliding head drill press, 6-in. pipe cutting and threading machine, 2½-in. single head bolt cutter, cold saw, drill grinder, duplex emery grinder, two portable cylinder boring machines, portable boiler testing pump, valve reseating machine, two boiler feed pumps, three 20-ton locomotive coal-ing cranes and other supplies.

Proposals will be received until May 6 by the Quartermaster, West Point, N. Y., for stone crushing plant, steam engine and boiler.

The following bids were opened April 14 for supplies for the navy yards:

Class 1.—Six vertical steam pumps—Bidder 25, Blake & Knowles Steam Pump Company, New York, \$7050; 53, A. S. Cameron Steam Pump Works, New York, \$10,500; 66, M. T. Davidson Company, Brooklyn, N. Y., \$7560; 68, D'Olier Engineering Company, Philadelphia, Pa., \$15,960; 71, Drew Machinery Agency, Manchester, N. H., \$8847.60; 72, George E. Dow Pumping Engine Company, San Francisco, Cal., \$6426; 74, Ebling-Carpenter Company, Pittsburgh, Pa., \$6594; 94, R. H. Grey, Oakland, Cal., \$9900; 115, Harron, Rickard & McCone, San Francisco, Cal., \$8725.50; 178, National Electrical Supply Company, Washington, D. C., \$7722; 252, C. H. Wheeler Mfg. Company, Philadelphia, Pa., \$7470; 265, Warren Steam Pump Company, New York, \$4800; 271, Excelsior Equipment Company, Pittsburgh, Pa., \$9150.

Class 31.—One 10-hp. motor—Bidder 87, General Electric Company, Schenectady, N. Y., \$238; 253, Western Electric Company, New York, \$336.25; 262, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., \$319.

Class 61.—One vertical adjustable spindle drill—Bidder 111, Hill, Clarke & Co., Boston, Mass., \$1225; 160, Manning, Maxwell & Moore, New York, \$1250; 186, Prentiss Tool & Supply Company, New York, \$1120 and \$1245; 193, Pratt & Whitney Company, Hartford, Conn., \$1935.

Class 71.—One toolmakers' engine lathe—Bidder 107, Hendey Machine Company, Torrington, Conn., \$1045; 193, Pratt & Whitney Company, Hartford, Conn., \$1413.25.

The following bids were opened April 14 for a 12-in. centrifugal pump for the Isthmian Canal Commission:

General Electric Company, Schenectady, N. Y., motor only, \$420. R. D. Wood & Co., Philadelphia, Pa., complete equipment, \$1400. D'Olier Engineering Company, Philadelphia, Pa., direct connected pump and motor, \$1095. Manning, Maxwell & Moore, New York, for pump motor and belt, \$1241, or complete with pipe and all fittings, \$1668. Buffalo Steam Pump Company, Buffalo, N. Y., for pump, motor and belt, \$1233.

Under bids opened February 25 for machinery for the navy yards, the B. F. Sturtevant Company, Hyde Park, Mass., has been awarded class 212, two 7½-hp. motors, \$614.

The Tindel-Morris Company, Eddystone, Pa., has been awarded class 101, one crank shaft lathe, \$2400, under opening of March 3 for machinery for the navy yards.

The following awards have been made for machinery for the navy yards, bids for which were opened March 24:

Chicago Pneumatic Tool Company, New York, class 71, 15 pneumatic scaling hammers and spare parts, \$935.60; class 72, five pneumatic hammers and spare parts, \$119.90; class 73, three pneumatic hammers and spare parts, \$65.90; class 74, six nonreversible pneumatic drilling machines and spare parts, \$230.25; class 76, one pipe yoke riveter and spare parts, \$214.70.

Independent Pneumatic Tool Company, Chicago, Ill., class 75, six pneumatic wood boring machines and spare parts, \$277.86.

Thomas Andrews Mfg. Company, Rockaway, N. J., class 77, one pneumatic tube cleaner and spare parts, \$235.20.

Hilles & Jones Company, Wilmington, Del., class 101, one motor driven gate shear, \$4985.

Under opening of March 31 for machinery for the navy yards, Wickes Bros., Saginaw, Mich., have been awarded class 61, one set standard plate bending rolls, \$985.57.

The following awards have been made for motors for the navy yards, bids for which were opened April 7:

General Electric Company, Schenectady, N. Y., class 51, four electric motors and one oil circuit breaker, \$499.21.

Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., class 61, seven 25-hp. induction motors, \$2995.

HARDWARE

NOTWITHSTANDING the marked advance there has been in the business and accounting methods of manufacturing plants, there is still much to be accomplished in this field. While there are many factories in which costs are ascertained and recorded with sufficient accuracy, there are many others in which this important matter is neglected, to the serious detriment of the interests of the business. Not a few manufacturers are adhering to antiquated methods, which were general a few years ago, but have now in most well ordered and up to date concerns been superseded by cost and accounting systems which show the profit or absence of profit in the production of any given line of goods. Unless the actual cost of goods is definitely and systematically ascertained there is a large probability that manufacturers will be mistaken in regard to the profits they are realizing, and that many products supposed to be profitable are really made at a loss.

Very few manufacturers confine their productive energies to the making of a single line of goods, and it not infrequently happens that the losses sustained on some goods are concealed by the profits made on others, the good line bearing the burden of carrying along the poor one. An illustration of this occurred in a recent conversation with the head of a large and long established corporation. The subject of the cost of manufacturing was introduced, and the inquiry made as to what methods he pursued to obtain his costs. The reply was, "We do about as we have always done. First we set down the net cost of material used, then to that we add the labor cost as near as we are able to figure it, and to the total of material and labor add a certain percentage for all indirect expenses. We then take the price for which the goods are sold, deduct the cash discount allowed and the estimated cost of selling the goods, and it usually shows a net profit of from 20 to 25 per cent." Further inquiry, however, developed the fact that while on this method of figuring the cost there was apparently such a substantial profit, the total net profit at the end of the year was in the neighborhood of 8 per cent. In going into the matter subsequently it was discovered that one important line was manufactured at an actual and sometimes a heavy loss.

One serious defect in the cost system of this manufacturer, who is indeed a type of many, was that the percentage added for his indirect or overhead expense was reached by an erroneous method. It so happened that the base of the principal material used by this manufacturer was copper, the price of which, as has recently been so emphatically illustrated, is liable to wide fluctuations. Where the material, and especially a material which is of unstable price, is included in the base on which is computed the percentage for indirect expenses, the result will be of little value, so far as obtaining reliable and satisfactory figures is concerned. Had productive labor or productive working hours been made the basis the mistake into which this manufacturer was led would have been avoided. Coupled with that improvement of method there should have been installed also a system of factory accounting which would show the cost of each of the various products, so that it would be known whether or not one department or line of goods was bearing the

burden of another. It may sometimes be necessary to put goods on the market without profit, but in such cases the manufacturer should know what he is doing.

Condition of Trade.

A characteristic of the season's trade thus far is the number of small orders which are placed with those who have goods to sell, whether manufacturers or jobbers. This indicates the disposition of merchants to keep stocks down and to purchase very carefully for actual requirements, while the promptness with which as a general thing orders can be executed makes it quite feasible for them to pursue this conservative course. While on general principles this is a wise policy and one which should be continued, it necessarily entails a good deal of labor and some expense at both ends. This is illustrated in the experience of more than one jobbing house who, in view of the quietness of trade and the desirability of economizing, considered the feasibility of getting rid of some of their employees whose services might be dispensed with. It was found, however, on looking into the matter closely that this could not well be done, as there was nearly as much work for the force under present conditions as when the volume of business was 25 or 30 per cent. larger. The fact that both the wholesale and retail trade are pursuing this policy puts upon the manufacturers more than of late the burden of carrying stocks from which shipments can be drawn without delay. The reports from the country at large in regard to building are perhaps taken all in all reasonably satisfactory. A careful survey of the field shows that during the first quarter of the year there has been a large shrinkage in building operations in the country as a whole, January showing a falling off of 44 per cent., February of 41 per cent., and March of 40 per cent. A large part of this decrease is to be charged to cities, the reports from smaller places being much more favorable, while in some agricultural communities there is comparatively little ground for complaint. There is perhaps some comfort in the fact that these percentages of curtailed building show a slight improvement in each successive month. The general features of the market, as regards prices and movement of merchandise, are practically the same as in our last review. Changes which have occurred during the week are not radical or important. There is a good deal of revising of quotations and getting the prices of many goods on a slightly lower level. The iron market continues to be remarkably well sustained, especially in view of the moderate volume of current business. The indications for crops are excellent, and the country enjoys the substantial advantage of having a fine balance of foreign trade in its favor.

Chicago.

The intermittent recurrence of unseasonably cold days is held to be responsible to some extent for the tardy development of trade in some lines of seasonable goods. Weather conditions of this sort would perhaps ordinarily have no such appreciable effect, but with the limited stocks now carried by merchants the influences that accelerate or retard consumptive buying are properly reflected back to the jobber and manufacturer. Some reorders for Wire Cloth and Poultry Netting are beginning to come in, but the demand is not as active as it should be. It seems highly probable, however, that the buying season

will be more prolonged than usual; in fact, if merchants continue to restrict their purchases to immediate needs, as they have been and are doing, it will be coextensive with buying by consumers. Supplemental orders for steel goods and Lawn Mowers are also beginning to make their appearance, but hardly in the volume that was expected in view of the known meagerness of first orders placed. Still the fact that the weather has not been of a sort calculated to stir the trade in Northern territory may account in part for the lack of expected seasonable activity. With the final disappearance of cold rains and chill winds there is every reason to expect a decided improvement in the movement of these goods. Stocks of Wire Nails in the hands of jobbers and retailers are not large enough to admit of extended delay in the shipments of replenishment orders, and for this reason the demand for prompt shipments is on all hands urgent. Notwithstanding this the mills, not only of the principal interest, but those of some independent producers, are beginning to lag a little, and from a week to 10 days now intervenes between the receipt and shipments of orders. The numbers of building permits being taken out in this city foreshadows a better demand locally for Builders' Hardware when the active work of construction begins. While the great majority of these permits are of a character that will require cheap and medium grades of goods there are a few large buildings for which the Builders' Hardware has not been let, notably the La Salle Hotel and the University Club. Of a different character, but requiring a large amount of Builders' Hardware of various kinds, is the new plant of the Corn Products Company, now in course of construction, which will comprise 25 or 30 buildings in all.

NOTES ON PRICES.

Wire Nails.—Buyers continue to order in small lots and are not contracting ahead. It is feasible to keep stocks complete under present conditions as mills are making shipments promptly enough to meet all requirements. No intimations have been forthcoming of any immediate change in price. The market is steady, except that the difference in price to wholesale and retail buyers is not always enforced. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....\$2.05
Carload lots to retail merchants..... 2.10

New York.—Business continues along moderate lines, orders being for small lots for immediate requirements. Regular quotations are on the basis of \$2.40 per keg for small lots at store.

Chicago.—While new business is still being offered in moderate volume and the demands upon the mills for shipment are heavier than at any time during the present season, it is probable that the crest of the spring buying movement has been reached. Just now shipments from mills of the principal interest and some independent producers are from a week to 10 days behind, but bookings do not run far ahead and this is regarded as a temporary condition. The demand from agricultural sections will likely slacken somewhat as soon as seeding operations are well under way throughout the country. Buyers continue to consult present requirements in placing orders and are keeping stocks as low as possible. While not anticipating any immediate revision of prices the feeling prevails that should any change occur it will be toward a lower rather than a higher level. Quotations are as follows: \$2.23 in car lots to jobbers, and \$2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Orders for Wire Nails being placed with the mills are for small lots only, buyers taking in only such quantities of Nails as are necessary to keep their stocks complete, but are not disposed to contract ahead. The mills are making prompt shipments, so that there is no delay in receiving Nails, and with no prospects of higher prices for some time at least, there is no incentive for consumers to buy ahead. The market is firm, with the exception that the differential in price between whole-

sale and retail buyers of carloads is not always observed. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....\$2.05
Carload lots to retail merchants..... 2.10

Cut Nails.—The movement of Nails from mill continues light, although from some sections where more or less building is under way, a larger demand is experienced. The market is irregular, and concessions of about 10 cents are being made on regular Steel Nail quotations, which are as follows: \$2.05 base, per keg for carload lots at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—Demand for Cut Nails is small, and does not average up to the usual proportion with Wire Nails. Regular quotations are on the basis of \$2.30 per keg, for small lots at store.

Chicago.—Though somewhat belated, the usual seasonable demand for Iron Shingle Nails is beginning to make its appearance, but in diminished volume. Some fair orders have been coming in from outside jobbing centers, where building activity is increasing with the advance of spring. Outside of this demand trade is extremely quiet. Regular prices are no longer representative of values since quotations are openly made on a lower basis. The prices, as herewith revised, are in some cases shaded and should a widening spread between Cut and Wire Nails develop, the result would naturally be to stimulate the demand for the former. Chicago quotations are nominally as follows: Iron Cut Nails, carloads, to jobbers, \$2.23; to retailers, \$2.28; Steel, to jobbers, in carloads, \$2.03; to retailers, \$2.08.

Pittsburgh.—Demand continues very light, buyers placing only small orders for actual needs. It is hoped that the favorable weather, with the increased building operations, will stimulate demand for Cut Nails in the near future. Prices continue to be shaded from 10 to 15 cents per keg over the official prices. We quote Steel Cut Nails at \$1.90 to \$1.95, f.o.b. Pittsburgh, for carload lots, and about \$2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about \$2.05, at maker's mill.

Barb Wire.—An increased demand is showing itself with the advance of the season, but orders, while numerous, are for small quantities with requests for prompt shipment. Jobbers are evidently keeping their stocks down to modest proportions, so as not to accumulate an undesirable quantity of Wire. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.20	\$2.50
Retailers, carload lots.....	2.25	2.55
Retailers, less than carload lots.....	2.35	2.65

Chicago.—The effect of favorable weather during the past few days has been to bring out an increased volume of business from Northern points, where it has been somewhat backward in developing. A fair amount of new business is being entered, but the insistent demand for prompt shipment clearly indicates that the orders placed are designed to supply only immediate requirements, and do not include stock provisions for anticipated future trade. In this respect it differs from the buying of a year ago, and while it will not equal the volume of that period it is not likely to prove disappointing in view of present conditions. Mill prices are reported to be firmly maintained. We quote as follows: Jobbers, Chicago, car lots, Painted, \$2.38; Galvanized, \$2.68; to retailers, car lots, Painted, \$2.43; Galvanized, \$2.73; retailers, less than car lots, Painted, \$2.55; Galvanized, \$2.85; Staples, Bright, in car lots, \$2.35; Galvanized, \$2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The volume of new business being placed with the mills is increasing, and dealers are insisting on prompt shipments, showing that the Wire is going into actual use. Jobbers are disposed to keep their stocks

down to a minimum, with the result that they are buying more freely, but in much smaller quantities than was the case this time last year. Spring trade this year will be much less than last year, which was exceptionally heavy in the Wire trade. Prices on the whole are being maintained by the mills, but there is some little shading by some of the jobbers. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.20	\$2.50
Retailers, carload lots.....	2.25	2.55
Retailers, less than carload lots.....	2.35	2.65

Plain Wire.—As mills are in a position to make prompt shipments there is no necessity for buyers to contract ahead. The amount of Wire being purchased probably represents the actual consumption, as it is not desirable to accumulate stocks. Prices are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots.....	\$1.90
Retailers, carload lots.....	1.95

Chicago.—No material change has developed in the character or volume of orders, which continue to represent only the immediate requirements of manufacturers. In some sections of the country the demand for woven and other forms of Wire Fencing is nearly normal, but in the aggregate it is considerably below that of last year. The tonnage being shipped by the mills represents very closely the measure of actual consumption, since manufacturers are not accumulating stock but are depending upon prompt shipment from the mills to supply their wants. Quotations are as follows: In car lots, to jobbers, \$2.08, f.o.b. Chicago, and to retailers, \$2.15.

Pittsburgh.—Orders for Plain Wire continue to be small and for actual needs of the buyers. There is no disposition on the part of the trade to contract ahead, as the mills are able to make prompt shipments, in sharp contrast to conditions at this time last year, while it is not likely prices will be any higher for some time at least, so that there is no incentive to contract ahead. We are advised that the mills are absolutely maintaining prices, but that some of the jobbers are shading the regular market to some extent. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots.....	\$1.90
Retailers, carload lots.....	1.95

Bolts and Nuts.—The tendency to lower prices is still observed in the market for Bolts and Nuts, although many of the leading manufacturers who are acting in harmony are endeavoring to hold quotations as steady as possible. On small Carriage Bolts a discount of 75 and 10 per cent. is obtainable by average trade and 70 per cent. on larger sizes. The corresponding level of Machine Bolts may be represented by a quotation of 75, 10 and 5 per cent. discount on smaller and 70 and 10 on larger. Nuts are not firm, and it should be remembered that in both Hot Pressed and Cold Punched varieties blank and tapped Nuts are now selling at the same price. Stove and Tire Bolts do not participate in the downward movement, being practically steady, although on a fairly low level.

Jack and Safety Chain.—Several manufacturers of Jack and Safety Chain have sent out lower quotations, the reductions being particularly noticeable on Safety Chain and on brass Jack Chain. The special discounts which have formerly been reserved for quantity orders are now offered on purchases of moderate size. The market may be represented in a general way by the following discounts: Iron Jack Chain, 60, 10 and 7½ per cent.; Brass Jack Chain, 65 per cent.; Safety and Plumbers' Chain, 75 per cent.

Cotton and Canvas Belting.—Buyers of Cotton and stitched Canvas Belting are finding prices on these lines fairly stiff, in spite of the reduced volume of business and the weakness of raw cotton. Concessions are of course occasionally made in the endeavor to clinch orders which are needed at the mills, but on the other hand manufacturers' costs are but little if any lower, as they are still working on material contracted for at comparatively

high prices. The market for Cotton Belting may be represented by discounts of 60 and 10 per cent. on cut lengths and 70 per cent. on full rolls; on Canvas Belting, ruling quotations are 70 and 5 per cent. discount on cut and 70 and 10 per cent. on full rolls.

Leather Belt Lacing.—Steps have recently been taken by the Lace Leather manufacturers' association to publish the fact that members of the association guarantee full measure on all side or cut Lace manufactured or sold by them. It was felt necessary to take such action in view of the increasing laxity of a few manufacturers in putting up bundles of cut Lace supposed to contain 100 ft. and in stamping the measurements of Lacing Sides. In this way they have been able to undersell more scrupulous manufacturers who were particular that their customers should get what they paid for. Unfortunately the practice has been winked at by some jobbers, who did not feel called upon to check the manufacturers' measurements in reselling the Lace, especially as retailers and consumers rarely take the trouble to find out exactly what quantity they receive. The association is to be commended for coming out strongly against this abuse and the trade should co-operate with them by guarding against the purchase of short measure Lace, which may continue to come on the market.

Axes.—Generally speaking, the Axe market may be said to be in somewhat better shape, owing to the fact that some of the manufacturers have announced advances in their base prices. We are advised, however, that no change has been made by the American Axe & Tool Company, Glassport, Pa. Other manufacturers have not yet announced what they will do. Whatever may be the course of the market there is no doubt that many orders were entered at the low figures, so that if an advance should be established at this late date it would not put the market back to where it was before the break. If the price could be maintained on a higher level than is justified by the manufacturers' present selling prices, it would certainly be advantageous for those who have already purchased and for those who have carried goods over from last year, the sale of which was so greatly interfered with by the financial disturbance which culminated about the time that Axes should be moving freely. It is, however, apparently going to be a difficult matter to accomplish this.

Sash Cord.—It is to be regretted that the competition on Sash Cord threatens to result in a more general putting on the market of goods of inferior quality, selling at prices based on the diminished cost of their manufacture. As noted in our last issue, some manufacturers of common White Braided Sash Cord, the quality of which as a general thing has been so well maintained by the old and well-known makers, have offered to make Cord of various lower qualities and to sell it at corresponding concessions in price, even to the extent of quoting 3 or 4 cents a pound less than the regular standard goods. It is to be hoped that this will not be done and that inferior goods will not take a prominent place in the market. It is certainly undesirable that quality should be sacrificed in goods, the replacing of which is attended by so much inconvenience and expense.

Brass Cocks.—The market for Brass Cocks and Bibbs, which a couple of weeks ago was reported to be in somewhat better shape, is showing renewed weakness, in sympathy with the decline in Copper and Brass. Quotations to the smaller trade are perhaps no lower, but concessions are again being offered to larger handlers of these lines.

Agricultural Wrenches.—The sharp competition for orders for Agricultural Wrenches is still going on, and in some instances lower prices have been made than those quoted two or three weeks ago. A discount of 80, 10 and 10 per cent. may be named without touching on the concessions obtainable by jobbers and other large buyers.

Paris Green.—Manufacturers of Paris Green have, as yet, announced no prices, though it is expected that they will not defer so doing much longer. Makers of Green state that the raw material market is not in enough of a settled condition to justify them in making prices at present.

Rope.—During the early part of this week some good

sized orders were received, indicating that stocks have become depleted in jobbers' hands to such an extent that they have been forced to replenish. The usual run of orders have, however, been for small quantities, and while the volume of business has not fallen off for the last few weeks there has been no general increase. With the moderate amount of business usually offered, there is little incentive to shade prices. The stability of the market is tested when a carload buyer submits specifications, as quotations are sometimes made which are nearly equivalent to changing one dollar for another, especially when he is an old customer, whom it is desirable to retain for more prosperous times. The following quotations, for base sizes, fairly represent the market: Pure Manila, 10¼ to 11 cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Cotton Rope.—The regular grades of Cotton Rope are being held at about the prices which have ruled for some time. There are on the market, however, grades of Rope made of inferior or mixed stock, on which quotations of 7¼ cents per pound, basis, on reels, and 8¼ cents per pound, basis, in coils, have been made.

Window Glass.—The new schedule of prices, 90 and 35 per cent. discount, for single and 90 and 40 and 5 per cent. discount for Double Strength Glass, recently made by the American Window Glass Company, has not resulted in the shutting down of any hand operated factories, according to available information. It is reported that about 40 per cent. of the hand factories are meeting the above prices, and in rare cases a 2½ per cent. commission is being added, while the rest of the factories are trying to get something better than 90 and 30 per cent. discount for single and are meeting the American's price on double. These discounts are for factory shipments, based on manufacturers' list. Most of the hand made factories are supposed to be working on a sliding scale of wages, so that the lower price of Glass has had the effect of reducing the workmen's earning capacity. Under ruling conditions the Glass being produced is said to be of rather inferior quality. Demand from both manufacturers and jobbers is light, as conditions offer no inducement for stocking up beyond requirements. In New York and vicinity business is very quiet. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single Strength, 90 and 25 per cent.; Double Strength, 90 and 30 per cent. discount from jobbers' list. These prices, are, however, not closely adhered to.

Linseed Oil.—The reduction of 1 cent per gallon in the price of Oil, announced last week, is regarded by some in the trade as an ill advised move. It is believed that if crushers had maintained prices a little longer buyers would have been more willing to place larger orders. The result of the lowering of price has been to engender a distrust in the future stability of the market. The falling off from the quantity of Oil purchased last spring has been very marked. Demand is still along conservative lines and confined to nearby requirements, both on contract specifications and new business. Local quotations are as follows: In 5-barrel lots, State and Western Raw, 40 to 42 cents; City Raw, 42 to 43 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The market has steadily declined, the easier tone, resulting from more plentiful supplies as the new crop is now coming in. Demand at this point is light, especially from manufacturing interests. The New York market is represented by the following quotations: Oil Barrels, 48½ to 49 cents; Machine Made Barrels, 49 to 49½ cents.

The Forest City Hardware Company, Rockford, Ill., capitalized at \$5000, about May 1 will open up in business, carrying a line of Builders' and General Hardware, Sporting Goods, Bicycles, &c. The officers of the company are Otto C. Hultberg, president; Henry Hultberg, vice-president; Oscar Hultberg, secretary and treasurer.

LETTERS FROM THE TRADE.

THE BUSINESS SITUATION AND OUTLOOK.

To the Editor: On the 6th inst. we addressed the following letter to several hundred of our larger customers:

"Will you favor us with a brief statement of your opinion as to the present condition of business, and the outlook for the immediate future, especially so far as that opinion is based on present conditions and prospects in the territory in which you operate and with which you are most familiar?"

"Anticipating your response, we will state, as to ourselves, that the volume of our Hardware business thus far in 1908 is about two-thirds that for the corresponding period in 1907, that the period of the greatest decline appears to have been passed, that the volume of incoming orders appears to be increasing slowly but steadily, that the character of the orders indicates that the stocks carried by our trade customers are small and need replenishing (a fact which many of them confirm), that in placing orders our customers show increasing confidence as to the return of business to more normal conditions, and that from the indications reaching us from these and many other sources, we feel much confidence ourselves that the worst is over, that business will steadily, even if somewhat slowly, improve, and that if no unforeseen or untoward events occur during the coming six months, the close of the presidential campaign will see the business interests of the country on a satisfactory basis of volume, prices and profits. In brief, we are conservative optimists."

We have received 195 replies to this letter, many of them from leading houses. The general tone is one of substantial accord with the statements set forth in our letter, the agreement being especially apparent on the following points:

1. That the worst is over.
2. Conditions already somewhat improved.
3. Confidence that further improvement will be steady, even if slow.
4. Stocks light, but not exhausted; present buying for immediate wants.
5. Collections generally normal, except those from speculative builders.
6. General hopefulness and confidence as to the future.
7. As to prices, doubt if reductions would stimulate consumptive demand; preference for stability and patience.

Many of the letters deal with these questions at much length and contain much valuable information, especially as to local conditions, but the foregoing is a consensus of the views which they express, and which fairly may be regarded as those of the Hardware trade at this date.

YALE & TOWNE MFG. COMPANY,

HENRY R. TOWNE, President.

NEW YORK, April 21, 1908.

MANUFACTURERS SELLING RETAILERS AND CONSUMERS.

To the Editor: There are many complaints among wholesale Hardware and Cutlery merchants all over the country with reference to trade as not up to the average of former years. If most of the manufacturers and agents representing manufacturers continue selling many of our customers, meaning the retail merchants and large consumers, we may expect business to be still poorer. I find in this section of the country that where there exists a medium size Hardware and Cutlery house, some of the manufacturers and their agents are after them. While it is admitted some will not sell as low in price as they do to the wholesale catalogue houses and jobbing houses whose business is largely with retail merchants, department stores, railroads, mills, &c., they will sell to our customers as low as to us or at a slight advance. In some cases retailers and others are charged higher prices than the jobbers offer. The merchant is misled by the manufacturers' salesmen frequently, asserting that as agents or representatives of manufacturers they can offer the goods at factory prices. The storekeeper not being thoroughly posted concerning prices, often gives the salesman an order at a higher figure than the wholesale trade would sell the goods.

All manufacturers and manufacturers' agents are not included in this accusation, but, nevertheless, numbers of

them do call on the customers of the regular jobbers and of the wholesale catalogue houses who sell only to merchants in the trade. Another trade abuse is the employment of a cheap grade of salesmen by some jobbers who run down competitors' goods. CHARLES WEILAND.

New York, April 20, 1908.

AMONG THE HARDWARE TRADE.

Hunt & Schuetz, Sioux City, Iowa, handling Hardware, Sporting Goods, Furnaces, Stoves, Butchers' Supplies, Guns, Ammunition, Sheet Metal Work, Cornices, &c., was recently incorporated with a capital stock of \$25,000. The officers of the company are as follows: Walter D. Hunt, president; Charles N. Schuetz, vice-president and treasurer; John A. Jacobs, secretary.

J. C. Wooldridge, Hedley, Texas, has put in a line of Builders' Hardware in connection with his lumber business.

Cole & Nafus are about to engage in the Hardware business at Hayti, S. D., and will erect a new building in the spring.

The H. B. Lay Hardware Company, Itasca, Texas, organized to handle Implements, Wagons, Buggies, Harness, Hardware and Saddlery, has been incorporated with a capital stock of \$10,000. The officers of the company are as follows: F. B. Lay, president; J. C. Reese, vice-president; R. H. Brown, secretary.

L. H. Mason, Republic, Wash., has closed out his Hardware, Stove, Implement, Paint and Sporting Goods stock to Stack Supply Company.

The Chipman, Hancock Hardware Company, El Dorado, Ark., organized by T. N. Chipman, E. D. Chipman and B. A. Hancock, has lately opened up in business.

A. E. Carlson, who has been an employee of N. D. McCutcheon & Co., Ltd., Idaho Falls, Idaho, Hardware and plumbing, has purchased a third interest in the company, and will take charge of the contract department.

J. H. Tenhopen, Grand Rapids, Mich., has been succeeded by Begler & Cox, who have purchased his stock of Hardware, Tin, Sheet Iron and Copper work, which business they will continue at the former location.

Linton Hardware Company, Esbon, Kan., has opened another store at Lebanon, Kan., and will handle general Hardware, Stoves, Implements, Paints, Sporting Goods, Harness, Vehicles, &c.

G. E. Kelly, Effingham, Kan., has sold a one-third interest in his Hardware and Implement business to D. D. Reece. The firm will be known as G. E. Kelly & Co.

Hurdland Hardware Company, Hurdland, Mo., has been incorporated with a capital of \$9000, to handle Shelf Hardware, Stoves, Implements, Vehicles, Harness, Paints and Sporting Goods.

R. J. Anthony and H. L. Balcorn, Waycross, Ga., have petitioned to incorporate in the Hardware, Stove and Paint business, under the style of R. J. Anthony Hardware Company.

The Kerr Hardware Company, Union City, Ind., has been incorporated with \$10,000 capital stock, to conduct the retail business. The directors are Wm. Kerr, C. F. Kerr and J. H. Morris.

As a recognition of 14 years' able service, T. C. Iler has been admitted to the Hardware firm of A. E. Bone-steel & Co., Troy, N. Y.

William Collard, Palouse, Wash., has entirely remodeled the store occupied by his Hardware, Stove and Implement business.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

F. O. SCHOEDINGER, Columbus, Ohio: Illustrated catalogue of Metal Interior Ornamentation, including Ceilings, Side Walls, &c.

JOHN L. GAUMER COMPANY, Philadelphia, Pa.: Mailing card referring to Wrought Iron Lighting Fixtures with attached card, which can be mailed, requesting complete catalogue.

CRONK & CARRIER MFG. COMPANY, Elmira, N. Y.: 1908 illustrated catalogue of Hardware Specialties, including Barn Door Hangers and Rail, Garden Tools, Pliers, Screw Drivers, Pruning Shears, &c.

HOLT-LYON COMPANY, Tarrytown, N. Y.: March, 1908, illustrated catalogue of Egg Beaters, Carpet Beaters, &c.

YOUNG BROTHERS, Worcester, Mass.: Illustrated catalogue of Ladders and Wooden Ware, including Pole, Extension and Cleaning Ladders, Step Ladders, Painters' and Masons' Trestles, Wall and Roof Brackets, Roof and Gutter Hooks, Lawn and Piazza Furniture, Ironing Tables, Clothes Dryers, Wagon Jacks, Baskets, &c.

BAKER MFG. COMPANY, Chicago: Illustrated booklet referring to Twentieth Century Graders.

CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio: Illustrated circular referring to Paradox Adjustable Reamers.

MATTHEWS MFG. COMPANY, Worcester, Mass.: Illustrated catalogue covering an extensive line of Sheet Metal Stampings, which are made to order in a variety of finishes.

H. B. FULLER, St. Paul, Minn.: Illustrated catalogue of Steel Adjustable Scaffolding, Step Ladders, Cold Water and Asbestos Dry Paste, Wall Cleaner, &c.

MARSHALL-WELLS HARDWARE COMPANY, Duluth, Minn.: Catalogue of Spring Sporting Goods, illustrating and listing an extensive line. Some illustrations are in colors.

WIRE GOODS COMPANY, Worcester, Mass.: Spring supplement to be added to Catalogue No. 6, giving changes in discounts, discounts on new goods and illustrating and listing numerous Wire Novelties which have been added to the company's line.

GLIDDEN VARNISH COMPANY, Cleveland, Ohio: Illustrated booklets and price-list circulars referring to Jap-a-Lac and other Varnish Specialties.

CHAS. E. MILLER, 97-101 Reade street, New York: Annual Automobile Catalogue No. 10 for 1908, containing 216 pages, illustrating and listing Motor Car, Motor Boat and Motor Cycle Parts, Fittings, Sundries, Tools and Clothing, together with American and European novelties. The catalogue will be mailed free on application.

Unique Agricultural Tool List.

UNDERHILL, CLINCH & CO., 94-96 Chambers street, New York, wholesalers of Hardware, Tools and allied merchandise, have just issued a unique price-list of agricultural tools carried by them in stock. It consists of stapled printed leaves of Forks, Hooks, Hoes, Rakes, Floral Sets, Barrows, Scythes, Snaths, Scythe and Grind Stones, and a multitude of other lines, kindred in character, without illustration, but having well chosen descriptive matter as to name, pattern, finish, handles, weights, &c., with the last column blank for the insertion of prices, more often net, but sometimes list and discount. The advantage of such a list is that all or any portion of it can be sent quickly according to the requirements of the merchant soliciting prices, the method of fastening the sheets together enabling the recipient to keep his prices down to date by taking out obsolete matter and substituting the latest advices.

NATIONAL HICKORY ASSOCIATION.

THE annual meeting of the National Hickory Association was held at the Sinton Hotel, Cincinnati, Ohio, on the 14th inst. The meeting was the largest and most interesting of any held under the auspices of this or any other like organization, indicating that the work of the association since it was launched has aroused public sentiment to the point that not only has the association been able to interest the Government and secure its assistance in carrying out the objects of the organization, but that those engaged in business which involves the manufacture or consumption of hickory are alive to the situation, and understand that in order that their present interests may be protected great activity must be exercised and that there must be an economical use of the remaining supply of hickory to insure against its entire destruction.

The Secretary, F. A. Curtis, Chicago, made a report covering in a general way the work of the association, the objects for which it exists and what it has so far accomplished. This report indicated that practical measures had been taken to economize in the supply and that organized bodies, such as the National Wagon Manufacturers' Association and the National Hardwood Lumber Association, jointly with representatives of the Forestry Service and the secretary of the National Hickory Association, had appointed committees who conferred on the matter of grading hickory vehicle products, such as hickory Axles, hickory Eveners, Singletrees, Neck Yokes, Bolsters, Reaches, &c. With the idea in mind of using all the material that could possibly be used, rather than of excluding all that could possibly be excluded, a standard of grades had been evolved which it is calculated will govern the production and consumption of these hickory products for all time, and while these grades have not been finally approved by the associations, there is no doubt they will be in the near future.

Mr. Curtis also said that the Forestry Service at Washington had taken up the commercial study of hickory, and at much expense and effort on the part of the Forestry Service, hickory had been secured from various parts of the country, cut under the direction of the Forestry Service men, after studying the conditions under which the hickory was grown, and samples from the various parts of the country had been tested, to the end that information was at hand indicating the relative strengths of the various kinds of hickory and the adaptability of the various species for different purposes, which information is now available to all.

The following resolution was adopted:

Whereas, It is the sense of the National Hickory Association that a census of the standing timber of the country is not only desirable but essential to the future welfare of the woodworking industries of the nation; therefore, be it

Resolved, That an appeal be made to the Senate and House of Representatives of the United States for an appropriation to make a census of the standing timber of all varieties in the country, to be made in connection with the forthcoming census report.

The officers chosen for the ensuing year are: John W. Herron, Royer Wheel Company, Cincinnati, president; E. W. McCullough, vice-president; W. A. Snyder, Pioneer Pole & Shaft Company, Piqua, Ohio, treasurer; F. A. Curtis, secretary, Chicago, and O. B. Bannister, Muncie Wheel Company, Muncie, Ind., chairman Executive Committee.

TRADE ITEMS.

E. C. ATKINS & Co., 64 Reade street, New York, manufacturers of Saws for numerous purposes, will about May 1 remove to 43 Warren street, where they will have the street floor and two lower floors, each 25 x 75 ft.

THE Retail Merchants' Association of Princeton, Ill., which was organized in August, 1906, with 50 members, has now 85 firms on the roll. Besides promoting co-operation and loyalty among the members, the object of the association is to advance the business interests and welfare of the city. In this connection the association has been largely instrumental in the getting out of a mammoth issue of the *Bureau County Record*, under date 1st inst., in which the various interests are featured and attention called to the home and business advantages

possessed by Princeton. The Hardware members of the association are the Priestley Hardware Company, T. C. Cowley and H. D. Gibbs & Son.

M. W. HANSCOM has retired from the Hanscom Hardware Company, Haverhill, Mass., having disposed of his interest to John S. Mason, formerly with the Treat Hardware Company, Lawrence, and Urban W. Leavitt, bookkeeper for the Hanscom Company. Mr. Hanscom retires after more than 40 years' successful identification with the Hardware business, he, with his brother, having formed a partnership in 1865 and establishing the business at about its present location. The new owners will continue under the same style, but will incorporate the business under the laws of the State of Massachusetts, Mr. Mason becoming president and Mr. Leavitt treasurer. The present floor space occupied by the company aggregates about 35,000 sq. ft., including two stores at 28 and 30 Main street, four stories high and basement, and eight two and three story warehouses situated elsewhere. A large and complete line of general Hardware, Agricultural Implements, Seeds, Sporting Goods, Blacksmiths', Painters', Machinists', Factory and Mill Supplies, &c., is carried at wholesale and retail.

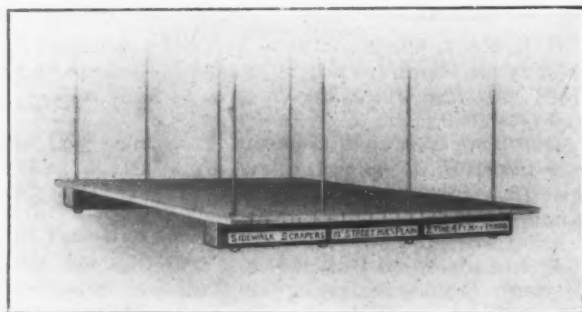
SEVERAL large new additions to the plant of the Union Metallic Cartridge Company, Bridgeport, Conn., have just been completed. On the 20th inst. the office force moved to the new four-story building at 739 Barnum avenue, where it will occupy an entire floor. The office of the sales agent, M. Hartley Company, will continue to be located as at present, at 313 Broadway, New York City.

SURPLESS, DUNN & Co., 68 and 70 South Canal Street, Chicago, manufacturers' agents, will remove about May 1 to 162 East Lake street. The company will occupy the ground floor and basement at this location and will carry stock for the prompt execution of orders.

WE are advised by the Diamond Chain & Mfg. Company, Indianapolis, Ind., that some manufacturers are marketing an imitation of the Diamond Repair Link, for replacing Links in Transmission Chains, even to the extent of copying the company's package and using its registered trademarks. It is stated that the imitation is poorly made, and is apt to break when under a considerable load. The company is prosecuting the infringers, but in the meantime desires to caution the trade against buying the substitute.

HANGING PLATFORM FOR STEEL GOODS.

THE accompanying illustration shows the method of storing Steel Goods employed by J. Russell & Co., Holyoke, Mass. This firm does a jobbing as well



Platform for Steel Goods.

as a retail business, carrying an extensive stock of these goods when in season. They may be found on an upper floor in the spacious warehouse occupying a hanging platform built for their accommodation. The frame of the platform is constructed by suspending two 2 x 4 in. timbers from the joists overhead by means of long Bolts about 4 ft. apart. On these timbers the floor of the platform is laid, the Bolts forming all the division necessary between bins, as the Implements are long enough to extend past them at either end. The outside timber affords space for marking the contents of the bins as indicated in the illustration.

A MARYLAND FIRM'S TRADE EXHIBITION.

THE enterprising firm of J. M. Davis & Sons, Oakland, Md., recently conducted a trade display or exhibition which proved to be exceedingly attractive and successful. As indicated in the very much reduced reproduction of poster issued in connection with the exhibition given herewith, the show continued for a period of two business weeks, beginning on Monday, March 9, and ending on Saturday, March 21. During this time the store was crowded with people from Oakland and surrounding territory. Both floors of the Davis establishment were given up to the display, the operation of many of the goods being demonstrated, so that the advantages and merits possessed by them could at once be grasped by the visitors. Four young women were engaged to show and explain the kitchen and household articles, and in this connection the washing of dishes with a dish washer, the making of cream in an ice cream freezer, the cooking of patty crisps on a range, steam cooking and baking, &c., were demonstrated. Several nights during the exhibition crisps were served filled with ice cream. On the second floor were demonstrations of washing machines, wringers, churns, sewing machines, cream separators, hay carriers, gasoline engines, &c. An acetylene lighting plant was installed specially for the occasion, and with the electric light regularly used the illumination at night was particularly fine. This system of lighting also attracted much attention. A large line of chinaware was displayed in connection with a great variety of 10 cent goods, and this feature proved of more than ordinary interest to those who visited the store. Music for the occasion was furnished by an Edison phonograph operated by a young woman.

AD. LEEWITZ, managing director of Markt & Co., 107, avenue Parmentier, Paris, is about to return to France, after a visit to this country covering several weeks. This is in accordance with his custom at stated periods, in the interest of the well-known house of which he is the head; principally to maintain close touch with market developments here largely in connection with the smaller tools used by mechanics, together with lines of Shelf Hardware. The business of this house is almost entirely that of marketing goods of American production in France, much of which is as representatives of manufacturers especially in the introduction of goods comparatively new to the French.

Chas. Rounds, Yale, Mich., has been succeeded in the general Hardware business by Rounds Hardware Company, of which Mr. Rounds is president; C. E. Richards, secretary, and H. M. Ferguson, treasurer.

Joseph F. McCoy Company's New Catalogue.

THE JOSEPH F. MCCOY COMPANY, 157 Chambers street, New York, importers of and dealers in foreign and domestic Hardware, Cutlery, Chains, Tools, Machinery and Supplies for railroads and mines, has issued illustrated catalogue No. 10, containing 285 pages in loose leaf binder. Duplicate pages will be supplied on request,

TRADE EXHIBITION.

For Ten Days of Hardware, Farm and Garden Fencings, Stoves and Ranges, International Milk Separators, Washing Machines, Sewing Machines, Oil Cookers, Steam Cookers, Gasoline Engines, Alcohol Incandescent House Lighting, Acetylene Display for Houses and Stores.

From March 9th to March 21st.

We have arranged for a big Trade Display of our leading specialties during the month of March in order that we may show the trade more fully the working qualities of the most improved and up-to-date conveniences now in general use. Our plan is to show the various lines we are handling in actual operation. This will involve a great deal of work on our part, but we believe in showing goods and demonstrating as to their working qualities.

Chinaware and Dish Washer Display.

Ladies are always interested in this department. Here you will find a line of the latest styles brought direct from the factories at prices that will make it easy for you to buy. We will also exhibit a line of Hatched Dinner Ware that we have arranged to raise orders for in any quantity desired. Some of these sets are as high as \$100. If you are thinking of giving the goods and the having it all in one. A Complete Dish and Vegetable Washer will be demonstrated in connection with the dish line.

NEW PERFECTION

Wonderful Oil Stove.

Entirely different from all others. Easy to manage. Reduces fuel expenses. Always ready for business. Economical cooking, gets the most out of every dollar. If you want to see this one will show you the place.

PITTSBURGH PERFECT FENCES.

A New Improvement. Full Size of All Wires. No Way Wire Stronger Than Strand Wire.

With stay wires and strand wires, same size fence is stronger than before. You had a chance to buy wire, for fence and garden having made investigation of same size wire. We are always looking out for the best and latest improvements in fencing. We have it and can show you samples and prices with all the latest improvements.

THE PATTY CRISP IRONS.

A specially for parties and luncheons. Crisps can be served in many dainty ways for breakfast, luncheon or supper. The new iron is made of heavy sheet metal and is so constructed that it will cook the crisps evenly and quickly. They are available for sale at special prices. Crisps, crackers, pies and so on. These can be made at your own home, making nice luncheons.

For the Kitchen.

Our reliable kitchen appliances will give you more satisfaction than anything else you buy for the same money. They are simple and easy to use. They make house work easy. They give the best results. They are well made and durable. They will stand up to any test.

ICE CREAM FREEZERS.

The new Davis Freezer is the latest improvement in the freezer line. It will make ice cream in the most perfect manner. It is easy to use and gives the best results. It is well made and durable. It will stand up to any test.

DAVIS' NEW Steel Ranges.

We expect to exhibit a steel range that is sure to attract attention. It is made of heavy sheet metal and is so constructed that it will cook the food evenly and quickly. It is available for sale at special prices. Ranges, stoves, and so on. These can be made at your own home, making nice luncheons.

How to Cook by Steam.

Come and see how to cook by steam. It is the best way to cook food. It is easy to use and gives the best results. It is well made and durable. It will stand up to any test.

Ironing Trade Easy.

Learning day is always a hard one, but with the new line of ironing boards and the improved method that is used, it is made easy. To use these goods is as simple as to use any other goods. They are available for sale at special prices. Ironing boards, and so on. These can be made at your own home, making nice luncheons.

Uncle Sam Uses Paroid Roofing.

Paroid is the most perfect and most reliable of all roofing materials. It is made of heavy sheet metal and is so constructed that it will protect the roof from all weather. It is available for sale at special prices. Paroid roofing, and so on. These can be made at your own home, making nice luncheons.

DAVIS PAINTS.

Are you going to paint? No better time is there than now. Davis' White Paint is the best. It is made of heavy sheet metal and is so constructed that it will protect the paint from all weather. It is available for sale at special prices. Davis' White Paint, and so on. These can be made at your own home, making nice luncheons.

WHITE-WHITE WHITE BALL BEARING.

Will be exhibited and run with a White Lily Gasoline Engine of 1/2 horse power that is mounted for all kinds of work on the farm—pumping water, running with appliances and small machinery of various kinds.

The White Lily Line of Four Washers.

Will be exhibited and run with a White Lily Gasoline Engine of 1/2 horse power that is mounted for all kinds of work on the farm—pumping water, running with appliances and small machinery of various kinds.

Universal Bread Mixer.

Mixes and kneads bread in three minutes. Does away with hand kneading. Makes perfect bread.

Universal Cake Mixer.

Mixes batter for all kinds of cakes rapidly and easily. Simple to operate, certain in results.

Timothy and Clover Seed.

Now is the time to place your orders for Timothy and Clover Seed. See our line of samples. The seed can be furnished by any one. All good seeds are high, but in price to buy the best.

You are Especially Invited to Call and See.

Our display. Here you will find many things worthy of your attention. The demonstration will take place from 10 to 12 o'clock in the morning and from 2 to 4 in the afternoon and from 6 to 8 in the evening each day. Remember the date, from March 9th to March 21st.

The Ryan's Bay Carrier and New Bay Ranges.

We have constructed for a large quantity of Ryan's Bay Carrier and New Bay Ranges. They are available for sale at special prices. Ryan's Bay Carrier, and so on. These can be made at your own home, making nice luncheons.

J. M. DAVIS & SONS, OAKLAND, MD.

PLEASE POST

Poster Issued by J. M. Davis & Sons in Connection with Their Trade Exhibition.

and as supplementary pages are issued in the future they will be sent for insertion in the binder, thus keeping the matter strictly up to date. The business of this house dates back to 1796, when it was established by William Irving. The company is sole agent for the Irving Mfg. & Tool Company, Monarch Cutlery Company, L. Gueudet & Sons, French Pliers, Nettleton Mfg. Company, Nippers and Pliers, Ducharmes & Co., small Tools, Peugeot Freres, Saws, &c., Tangyes, Ltd., Jacks, Wm. Eades & Co., Pulley Blocks, Weiller & Co., Brass Wire Cloth, Francis Parker & Sons, Needles, Cocker Bros., Music Wire. It also represents in the New England States Geo. E. Gay, Screw Drivers, and Goodell Mfg. Company, Miter Boxes.

THE DOMINION OF NEW ZEALAND.

I.

BY JOHN L. SARDY.

LIKE Canada, this picturesque, fertile and prosperous country, now rejoices in being a Dominion instead of a British colony. Abel Jansen Tasman, the great Dutch navigator, gave the first authentic account of the discovery of New Zealand. After discovering Tasmania he steered an easterly course and on December 13, 1642, sighted what to-day is known as New Zealand. After Tasman's departure there is no record of any visit until the arrival of Captain Cook, who sighted the land on October 6, 1769. After the occupation of New Zealand by the British it became a dependency of the Colony of New South Wales, but was made a separate colony on May 3, 1841. Nothing is actually known as to the origin of the Maori natives. They were probably Polynesian immigrants and landed in New Zealand over 500 years ago.

Three Islands.

New Zealand is composed of three main islands—the North, the Middle or South and Stewart islands, in addition to which there are several groups of small islands, some distance from the main ones. The main islands have a total zig-zag coast line 4330 miles in length, the North Island being 200 miles longer than the Middle Island. Stewart Island is only 130 miles long, and not worth visiting by an American Hardware traveler, unless he wants to get some of the best oysters in the world, bar none.

The North Island, with an area of over 44,000 square miles, population over 476,000, and the Middle Island, with over 58,000 square miles and population over 411,000, are the two places for business.

The total white population of the Dominion, according to the census up to April, 1906, was somewhat over 888,000, in addition to which there were about 5000 Chinese and half castes, and over 47,000 Maoris, the latter having increased about 8000 in the 10 years between 1896 and 1906.

The estimated private wealth of the Dominion is £240,000,000 sterling.

Imports and Exports.

In 15 years the imports have more than doubled, amounting in 1905 to the value of nearly £13,000,000 sterling.

Hardware, including Iron and Steel, Nuts and Bolts, Cutlery, Agricultural Implements, Nails, Tools, Lanterns, Lamps, &c., easily leads, showing importation to the value of £1,500,000 sterling, a good proportion of which is American, Canada coming in for her share on account of the preferential tariff. For instance, Canadian Wire Nails are knocking out those made in the United States, the tariff on Nails other than British make being higher to the extent of one-half of the duty paid on Canadian Nails.

The total value of exports exceeds imports by about £3,000,000, Great Britain taking over £12,000,000, while the United States takes considerably less than £1,000,000 sterling.

Wool forms the leading article, from 140,000,000 to 150,000,000 lb. being annually exported. Frozen meat, butter, cheese, kauri gum, phormium fiber and gold and silver come next.

Imports from the United States rank next to England, Germany being out of it in comparison. American Hardware and kindred articles run into the most money, kerosene and tobacco coming next.

Total present annual imports from the United States amount to about £1,500,000. New Zealand sends us kauri gum, phormium fiber, wool, &c., to the extent of about £800,000 per annum.

Government Railroads.

With the exception of only somewhat over 100 miles, the New Zealand railroads are owned by the Government. In 1890 the length open was 1842 miles, which served to carry nearly 3,500,000 passengers and over 2,000,000 tons of freight. Sixteen years later there were

2407 miles in operation, transporting 9,000,000 passengers, and about 4,500,000 tons of goods, of which minerals amounted to not much under 2,000,000 tons, and wool, timber and grain over 1,500,000, to say nothing of live stock.

Principal Cities.

The four principal cities in New Zealand are Wellington and Auckland in the North Island, the former with a population of over 63,000, and the latter over 82,000.

In the Middle Island are Christchurch, population about 68,000, and Dunedin with over 56,000. Just south of Dunedin is Invercargill, a town noted for having a lamp post nearer to the South Pole than any in the world.

All these cities are go-head places, especially Wellington, the seat of government, which has advanced wonderfully in the last 10 years, and to-day very likely exceeds Auckland in the volume of trade done.

In all four there are numerous well appointed Hardware establishments doing a thriving trade in all kinds of goods usually stocked by modern Hardware firms.

Christchurch is perfectly flat, with fine, even roads and remarkable for the great number of bicycles in use. There is no place of its size in the world where so many are to be seen. Every one, men, women and children, are wheel devotees. Even the chimney sweeps carrying their tools of trade, do so on wheels. According to the last available custom's report the value of bicycles imported into New Zealand was over £70,000 sterling, while the importation of materials for bicycles ran into more than £120,000 sterling, which would indicate that a large part of the machines are assembled locally.

C. I. F. Company.

THE C. I. F. COMPANY, 11 Broadway, New York, is issuing trade literature and circular letters, price-list sheets, &c., to the trade abroad, so prepared as to be conveniently filed in binders, provided by it for that purpose. This company, established about a year ago, has been located since the beginning of the current year at the above address, and is in a position to quote c.i.f. prices, including commission, as export commission merchants to buyers abroad on machinery, Tools and allied merchandise. This system is a practical recognition of the innumerable perplexities with which foreign merchants are frequently confronted in figuring prices based on our form of discounts and the numerous expenses inseparable from purchases accruing between source of supply and outport or inland market, as the case may be. The distinguishing feature of this enterprise is so to quote in regular form that the information may be systematically kept intact for instant reference, divested of the incidentals, enabling the foreigner to know at a glance what the goods will cost laid down at any port or place for which through bills of lading can be obtained. The system includes the giving of much detailed information in regard to weights and measurements, representation in catalogues, list prices, &c., so as to facilitate as much as possible the intelligent placing of orders by foreign buyers.

MARTIN A. JOHNSON, Stoughton, Wis., a prominent Farm Wagon manufacturer, banker and merchant, died suddenly on 8th inst. Mr. Johnson was born on a farm near Stoughton, May 26, 1862. While still a boy he removed with his parents to Stoughton, where his father was engaged in the mercantile business. With the death of his father Mr. Johnson took charge of the business, in which he continued until 1891, when he was elected president and general manager of the Stoughton Wagon Company, in which capacity he served for 10 years. He was heavily interested in this company and served as a director from the time of its organization in 1883 until his death. In 1903 he was made cashier of the First National Bank of Stoughton. Mr. Johnson was also largely interested in the department store of Melaas, Johnson & Co. of Stoughton and owned a half interest in a similar store at Parker, S. D. F. Johnson Vea and M. M. Johnson Vea, now respectively president and treasurer of the Stoughton Wagon Company, are brothers of the deceased.

SUCCESS IN SPITE OF THE PANIC.

BY MISSOURI.

Merchants everywhere and of every class are now considering the problem, How long will the business depression last? How slow will the wheels turn? How will the readjustment thus called for affect the merchant's business?

When we speak of panic in the ordinary use of the word, we mean the depression or economic crisis which is sure to follow. Now, this crisis may be turned to a man's advantage if he understands and will apply the fundamental laws of business and credit to his own interests.

Credit and Money

which are directly and summarily affected by the panic, do not of themselves bring a man success or failure. They are useful mediums and stays, but they are not the essence of trade. Trade is the exchange of one surplus for another. It is supplying the need of one man with the overplus of another. It is an exchange for mutual good. The keynote of trade, then, is service.

We do business not with money, and it may be said now that the banks have got back to their normal condition it will be no more a question of money that will affect trade, it will be a question of credit. It is to this, through the banks, that we are to look for our mainstay. Credit makes the wheels turn, it furnishes the sinews for new enterprises, it carries us over hard times. Credit will be a somewhat diminishing quantity for perhaps a year. But this is one of the things that we cannot control, since the banks losing their volume of deposits because of a reduction in the volume of business, lower prices and a curtailment of loans, must curtail their accommodations. The merchant and manufacturer will be able to borrow for their legitimate needs, but it is well for them to understand that a law over which the banker has no control will force the latter to curtail loans for new enterprises.

The Merchant Must Shape His Business

to meet this new condition of the commercial and financial world. In a time of contraction the first thing to do is to trim the sails to meet the storm, let it be light or heavy. To do this the individual must get ready to be independent of credit asking. Let no man expect the same accommodations in the near future he has had in the past. Pay bills and get ready to ask only that which is necessary, and which will supply the needs of a business conducted economically, and with a view to present conditions. After this the study of the business man must be the wants and needs of his immediate vicinage.

Necessity for Curtailment.

The reason for this drawing in of enterprise on the part of the merchant and manufacturer is apparent. The consumer may or may not have as high wages, may or may not make as much money in the next few months as he has in the past. To get ready for a heavy trade that will not come, and borrow money to do so, is the very rock on which the ship will sink. He who has not strained his credit is the man who has a chance left to meet any untoward condition that may come. He who has borrowed to the last notch will find that when diminishing prices and idle labor are staring the banker in the face he may be compelled to call his loan. The merchant and manufacturer will look well to the credit department, because it will not do to make goods and sell them on a possible decline, pay high rates for money to do so, and then have the goods bring no returns. The first thing then is, get the decks clean. And an essential part of the house cleaning is not to hold depreciating stock for a higher price. Better let the consumer have it and get his money rather than carry it.

The Way to Save

is to economize. The consumer will study this first. He will leave articles of luxury to one side now that he is in expectation of a possible lower wage. But the man who keeps in advance of the wants and needs of his customer is the man who succeeds. It is he who can hold his own in the game of uncertainties. He does this by sticking close to his business, watching the trend of his individual

trade, turning his money as often as he can, and keeping watch on his customers. They are an index to his own success, and from them he can construe his line of conduct. There is no use in expecting the miners in a given district in a strike to spend as much as they would if all were at work. Apprehension will be enough to make them hesitate about the nonessentials.

Readjustment means bringing life down to a basis of rational, frugal and wholesome living. To meet this condition requires study on the part of the business man who deals with the masses. Success in spite of the panic comes to him who makes service his motto through all the deviations of his business.

Keeping at It.

There is no need for a man to get the blues and sell his business because of a time like this. There is more to business, anyway, than the mere accumulation of dollars. Commerce is the great civilizer. The man who performs his task well in trade has helped humanity. This is the noblest end of living. The dollars merely measure activity and good work for self and others. Therefore, it is the best for man to keep a spirit above the ups and downs of trade. He may be as happy during the next year as he has during the past if he will only fix his mood and life to this principle of service.

A Buoyant Spirit.

To serve is to help. And the serving man is one who studies the interests of those he comes in contact with. There is in this a buoyant feeling that will give the business man a clear eye and a steadfast manner. It will give him a gentle heart and a kindly disposition. The man who believes he is doing a good work, no matter that he is not making much money, will never grow oppressive in business. This may seem a far cry to some who look little on the philosophic side of business. But it has in it an element of success of which we little dream.

Industrial crises come because men in their eagerness to get rich, and to enjoy power and wealth, overstrain the capacity of credit to serve, and over expand the possibilities of commerce. There is no trouble about a lack of money. There is enough and plenty. There is no trouble about the banks; they will grant credit as usual for the legitimate needs of business safely and sanely conducted. This condition in which we find ourselves is but one of the results of our own overdoing, of our own overliving. The consumer is a gauge on the business of the world. When everything is flush all along the line men are prone to have the best. When wages and profits are reduced they may buy the same at the lower level, but it is inevitable that they must select the needful and pass by the luxuries.

Here is the Safety and Security

of those who are in ordinary lines of business to-day. They are in the legitimate. Whatever may come to other lines there will always be a modicum of trade in the necessities. Let the profits be less if they must, the readjustment will carry all things down together to the proper level. Trade, let it be for the best interests of man, it will have a proper volume. He will succeed who commands it as it comes and goes. And while the man is going on, studying the day's need and the year's outcome, lo! the lowering clouds have disappeared, and men are no longer talking about depression. The sun of a better prosperity is shining; and as he counts his profits at the end of the year they are as much or nearly as much as before.

TWITCHELL IRON COMPANY, Kansas City, Mo., has issued catalogue No. 10 devoted to an extensive line of Metal, Paper and Felt Building Materials, of which it is an important jobber. The book contains price-lists, illustrations, &c., of Sheets and Tin Plate, Eaves Trough and Conductor Pipe, Elbows, Cornices, Skylights, Metal Ceilings, Finials, Crestings, &c. The company was established in 1886 as the Kansas City Roofing & Corrugating Company, the name having been changed last fall. It owns and occupies a large modern warehouse, several views of which are given in the catalogue. Among the company's prominent specialties are Berger Metal Ceilings, for which it is general Western agent, and Elk Rubber Roofing.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM W. W. STORM, who has engaged in the Shelf and Family Hardware, Stove, Paint and Sporting Goods business, at Seattle, Wash.

FROM LAWSON-PETERSON HARDWARE COMPANY, successor to Lawson & Peterson, 619 Seventh street, Rockford, Ill., which has been incorporated with a capital stock of \$10,000, to do a retail business.

FROM HENDERS HARDWARE COMPANY, successor to N. T. Henders, Unionville Center, Ohio, which has been incorporated with a capital stock of \$5000. The company handles a retail stock of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Sporting Goods.

FROM JOS. A. SEDLACEK, Bremen, Kan., who has suffered loss by fire estimated at \$6500. A new building will be erected, 34 x 60 ft., with basement. The lines handled include Shelf and Heavy Hardware, Paints, Oils and Sporting Goods.

FROM CHAS. H. GARDNER, successor to Gardner & Jorgenson, Toledo, Ore., who is handling Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, Harness, Sash and Doors.

FROM L. E. LARSEN SUPPLY COMPANY, which has recently engaged in business in Crookston, Minn. A retail stock is handled, including Shelf Hardware, Stoves, Tinware, Paints and Sporting Goods. The company has repaired and improved the store building which it occupies.

FROM AULTS HARDWARE COMPANY, which has recently opened a retail store in Mt. Blanchard, Ohio.

FROM W. S. WOOLEY, who has recently engaged in the retail Hardware business in Dalton, Neb.

FROM W. CHRISTENSEN, Centralia, Wash., who has moved his Hardware, Stove, Paint and Sporting Goods business into a new store with modern windows, shelving and fixtures.

FROM BLANKENSHIP & HAHNENKRALT, Downs, Kan., who have formed a partnership to carry on a Hardware, Stove, Paint and Sporting Goods business.

FROM WUST BROS. HARDWARE COMPANY, St. Mary's, Ohio, which has been incorporated with a capital of \$20,000, and will handle Shelf and Heavy Hardware, Stoves, Paints and Sporting Goods. The company has a remodeled store equipped with modern fixtures.

FROM GEO. B. WAITH COMPANY, Ellington, N. Y., which has recently opened a Hardware, House Furnishing Goods and Agricultural Implement store.

FROM LEONARD HARDWARE COMPANY, Springfield, Mo., which has been incorporated with a capital of \$15,000 to deal in Shelf and Heavy Hardware, Stoves, Implements, Paints and Sporting Goods.

FROM CHARITON HARDWARE COMPANY, Keytesville, Mo., which has just embarked in the general Hardware, Stove, Tinware, Harness and Building Material business.

Ricker & Landes have purchased the business of Hicks & Smith, Eureka, Kan., including Shelf and Heavy Hardware, Stoves, Tinware and Agricultural Implements.

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Death of Charles Merrill.

CHARLES MERRILL died at his home, 316 Clinton avenue, Brooklyn, N. Y., Friday, April 17, of apoplexy, after about a week's illness. Mr. Merrill was born at Hallowell, Maine, in July, 1839. He went to San Francisco in 1857 and remained in California about 12 years. He became associated with what is now Holbrook, Merrill & Stetson, when the house, then Brittan, Holbrook & Co., was located in Sacramento, the main portion of the business later locating in San Francisco, where it still continues with branches in Oakland and Los Angeles, Cal., and New York City. He was five years with the old firm, when Mr. Brittan died and Mr. Merrill became a partner, under the style of Holbrook, Merrill & Stetson. The business, established in 1850, was incorporated August 28, 1882. Mr. Merrill had always been vice-president of the house, and was in charge of the branch in New York for about 40 years, most of that period at 218 Water street, but for some years at 256-257 Broadway. The house is one of the largest on the Pacific Coast wholesaling Stoves, Ranges, Metals, Housefurnishings, Pumps, Wind Mills and kindred lines. Mr. Merrill was of a kindly and sociable disposition, and belonged to several clubs, including the Brooklyn, Montauk and Crescent Athletic, in Brooklyn, where he has resided since about 1868. He is survived by a widow and three daughters.

Lee & Underhill.

LEE & UNDERHILL, 35 Warren street, New York, compelled by the marked growth of their business, will on or about May 1 occupy much larger quarters at 98 Chambers street. They will manufacture several of their own specialties on the premises, including the L. & U. patent slotted Tennis and Squash Rackets, patent socket Golf Clubs and Caddy Bags. They also represent as agents Crawford, McGregor & Canby Company, Golf Clubs; F. J. Bancroft, Tennis Rackets; R. T. Ederer Company, Tennis Nets; Sportsman's Supply Company, Canvas and Leather Goods, and the Rainbow Amusement Company, Roller Skates. In addition they distribute the Black Diamond, Kempshall, Haskell and Silk Pneumatic Golf Balls, and are United States agents for Gibson & Logan, Scotland, hand forged iron Golf Heads.

Display Board of Night Latches.

THE RUSSELL & ERWIN MFG. COMPANY, New Britain, Conn., and 94-98 Lafayette street, New York, is now furnishing the trade assortments of night latches on display boards, as shown in the accompanying



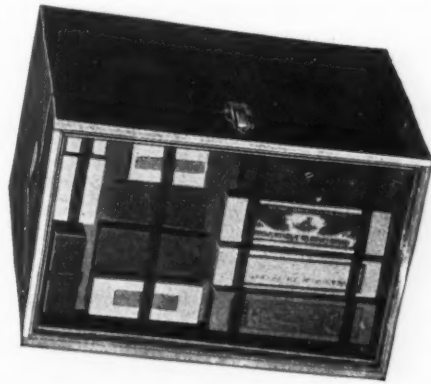
Display Board of Night Latches.

illustration. The boards are 1 3/4-in. solid oak, antique finish, and will be sold at the regular price of the latches plus a reasonable charge for the board and mounting. Six different Latches are shown in working condition and demonstrate the action and appearance of stock carried. If desired a Latch may be removed from the board and sold, as boxes and directions are furnished for the Latches so mounted.

Pike's New Assortments of Stones.

THE PIKE MFG. COMPANY, Pike, N. H., has made several additions to its Oil Stone and Scythe Stone assortments, one of which is shown herewith. These are

smaller than the original assortments, and are intended for Hardware merchants who wish to carry small but well assorted stocks of Oil and Scythe Stones and Razor Hones. The company claims that the assortments invariably increase sales on account of the careful selec-



Pike's Oilstone Assortment No. 1.

tion of stones to meet the needs of all users of edge tools, besides making an attractive display. They also afford a convenient and compact method of carrying stocks of these different kinds of Stones.

One Minute Washer.

The One Minute Washer Company, Sandusky, Ohio, is manufacturing the washer shown in the accompanying illustration. The tubs are constructed of tongued and grooved clear grain Southern cypress, each stave being curved and fluted. Being thoroughly kiln dried before use the wood is declared to be almost impervious to heat or water



One Minute Washer.

exposure. The staves in each tub are bound with two 1 1/4-in. steel hoops at the top and bottom, and later when mounting the castings a round steel hoop is put on the center. The castings are of best quality, and reinforced with ribs at the points of greatest strain. Each casting is handsomely enameled. The dolly is turned from hard maple, and adjusts itself up and down to suit the amount of clothes in the tub. The cover is double, the lower half resting inside the machine. The tub is well finished with one coat of filler and two coats of varnish. It is claimed for the washer that the flywheel underneath the tub maintains an even and continued motion, while the compound lever furnishes a smooth and easy stroke at the same time affording the maximum of power and preventing loss of motion. The operator may stand in an easy, natural position or by the use of the foot attachment may run the machine sitting down, as shown in the illustration. Because of its agitation of the clothes at high speed the washer is said to clean very thoroughly, since currents of hot, soapy water are forced through the fabric removing the dirt, but without wear on the garments.

The Pick-up Ratchet Wrench.

The Pick-up ratchet wrench shown in the accompanying illustration is of very simple construction, consisting of only two parts, the socket end with a series of peripheral teeth and a lever handle with an engaging lug. It is at once right and left handed without change of any kind, and can be used to advantage in inaccessible places.



The Pick-up Ratchet Wrench.

It is manufactured by the New Britain Mfg. Company, New Britain, Conn. At present it is made sizes 4, 6, 7, 10, 14, 18 and 24 in., with full line of square and hexagonal sockets in sets for the capacity of each size lever handle. The tool may be used as an automobile and motor boat spark plug wrench, with set of sockets for coach screws, for millwrights and carriage builders; for structural steel workers; for installing transmission gear with coupling and pulley bolts, and in sets for toolroom use, locomotive and automobile assembling and repairing and in many other directions. A large auto set, put up in a wooden case, contains a ratchet handle, 31 sockets, a universal joint, two screw driver blades, one 1 3/4-in. extension and one 9 1/2-in. extension.

The Dietz Power Washing Machine.

Fig. 1 of the accompanying illustrations shows the dasher used in connection with water motor in the



Fig. 1.—Dasher of the Dietz Power Washing Machine.

washing machine made by John Dietz Mfg. Company, Fifteenth and Plum streets, Cincinnati, Ohio. The tub

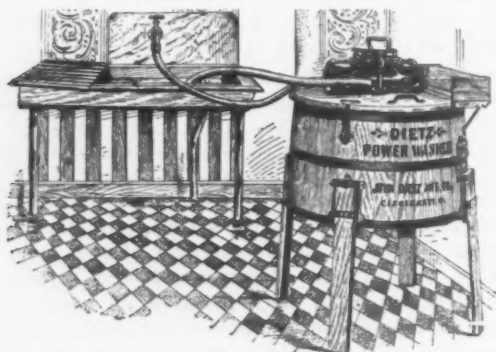


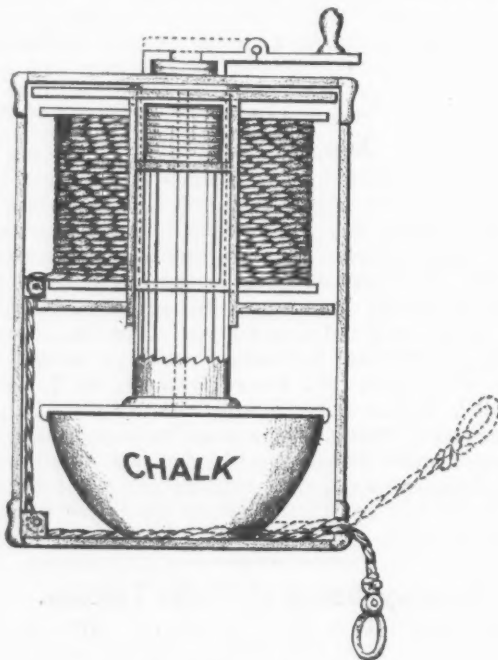
Fig. 2.—The Dietz Power Washing Machine.

of the washer is made of red cypress. The machine is said to develop an efficient working power under water pressure as low as 18 to 20 lb., and to be economical of

water under high pressure, especially where the supply is measured by meter. The motor is operated by connecting the inlet hose to a faucet and putting the exhaust hose in the sink, as shown in Fig. 2. The dasher has no projecting post or holes and does not float. It is fastened to the end of a grooved shaft which slides in a gear with a keyway, allowing the dasher to adapt itself to any amount of clothing in the tub. It is pointed out that the dasher cannot tear the clothes, as there is no center dasher post. The gear and rack are completely shielded to prevent injury to operator. The motor is at the center of the cover, so as to avoid lifting a heavy weight when opening the washer. The motor can be attached to any hand operated machine of the same type.

Self-Chalking Chalk Line.

The Cecil-Jones Company, Parkersburg, W. Va., is putting on the market a self-chalking chalk line outfit, the construction of which is shown in the accompanying illustration. It is made of IX tin, and is neat and compact,



Self-Chalking Chalk Line.

being 3 in. long by 3 in. in diameter. The line is wound on a reel in the top of the box, and runs through two small pulleys, one near the top and the other at the bottom. By drawing the line through an opening in the box opposite the bottom pulley it is forced to rub against the revolving chalk sufficiently to thoroughly chalk the line. Standard ball chalk is used, and chalk or line can easily be replaced by either cap, which is held in place by a lock groove. The line is especially recommended by the manufacturer for bridge builders, house and shop carpenters, sign painters, paper hangers, &c.

The Smiley Tomato Knife.

The Graves-Humphreys Hardware Company, Roanoke, Va., as sole selling agent, is offering the device shown herewith, for the use of canners of tomatoes and peaches. The blade is hand forged from steel, in spoon shape, with

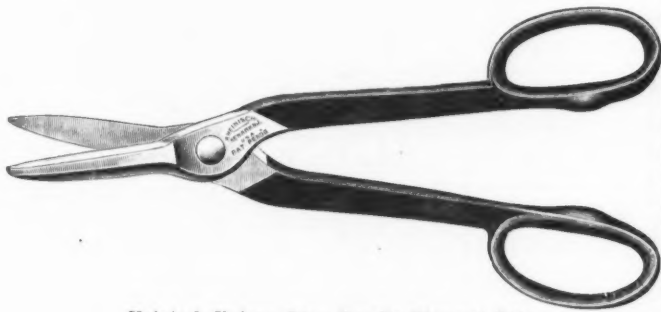


The Smiley Tomato Knife.

a long sharp point to facilitate the economical removal of stem and other objectionable portions from tomatoes or the pits from peaches. It is pointed out that this is accomplished with less loss of fruit than with a straight knife.

Heinisch Vulcan Pattern Snips.

R. Heinisch's Sons Company, Newark, N. J., and 155 Chambers street, New York, has increased its already extensive line of shears, scissors, &c., by the introduction of the Heinisch Vulcan pattern ring handle tinner's snips, here illustrated. This snip differs from the regular styles for either straight or circular cutting by reason of the peculiarity in the shape of the blades, both of which are exactly alike, being beveled toward the back on two sides. The blades are 11-16 in. thick and $\frac{5}{8}$ in. high, the ground back surface of each blade tapering from 7-32 in.



Heinisch Vulcan Ring Handle Tinner's Snip.

at the back to 1-16 in. at the point. The blades when closed thus serve to punch a small hole through sheet metal, which can be enlarged to a 1 1-16 in. diameter by a reamer-like action, from which to start cutting. The blades are steel laid and so ground as to enable the individual to cut either straight or curved lines and any kind of irregular figures in otherwise inaccessible places with one tool. They are recommended by the manufacturer as especially handy and serviceable in connection with cornice work. This snip, No. 9, is 13 in. total length, 4 in. from center of pivot to point of blade, with a full 3-in. practical cutting edge. The handles are drop forged and finely japanned, and, it will be noticed, can be used equally well by either right or left handed people.

Lawrence Trolley Barn Door Hanger.

The trolley barn door hanger shown in the accompanying illustration has recently been brought out by Lawrence Brothers, Sterling, Ill. Strength and durability are the



Lawrence Trolley Barn Door Hanger.

features especially emphasized by the makers in referring to the hanger. In order to test their qualities in this respect, we are advised that a pair of them were placed on

a door weighing 250 lb. and were kept in continuous operation without oil for 187 hr., running at the rate of 96 ft. per minute, the total distance traveled in this time being somewhat over 1,000,000 ft. When taken down for inspection the only effect observed as the result of the severe test was in the wear of the bearings, the track having suffered no impairment whatever. In examining the make up of the hanger it will be noted that it is constructed in two parts, consisting of the trolley carriage and the hanger strap. These are joined together by a removable pin, which greatly simplifies the work of swinging the door, and provision is made for lateral adjustment to suit various thicknesses of doors, thus bringing them up close to the building. Turning freely on the top hinge connecting the door plate with the suspension strap, the door can be swung out and raised to a perfect right angle with the rail. The rail is made on machines especially designed for this purpose, which not only secure perfect alignment, but turn them out uniform in all respects. The offset provided in the rail adds to its strength and prevents side friction of the hanger. Among the claims advanced for this equipment is that it is sleet, storm and bird proof.

Wing Screw Calks.

The accompanying cuts represent calks, with different kinds of points, for use in boots and shoes, with accompanying wrench, offered by North & Pfeiffer Mfg. Company, New Britain, Conn. The wings projecting from

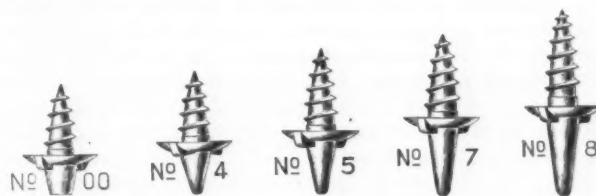


Fig. 1.—Wing Screw Calks.

the disk afford a place for the wrench to catch when screwing the calks into the soles. The wings also strengthen both the disk and spike, and increase the effectiveness of the calk to prevent slipping. The gimlet point increases the ease with which the calks can be inserted, or removed and replaced when they become blunt. It is pointed out that the broad disk prevents the calk bending over or driving through into the foot, also that the calks hold in wet or poor leather, making the use of expensive leather unnecessary. If the sole shrinks on drying, the calks may be tightened by a half turn with the wrench. The No. 00 calk is blunt and may take the place of the hob nail for general use by miners, quarrymen, golf and cricket players, sportsmen, &c. The No. 4 has a short, sharp spike, for use by surveyors, timber cruisers, &c. The No. 5 is for lumbermen's use when river driving, giving a secure footing on hard timber. Nos.

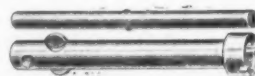
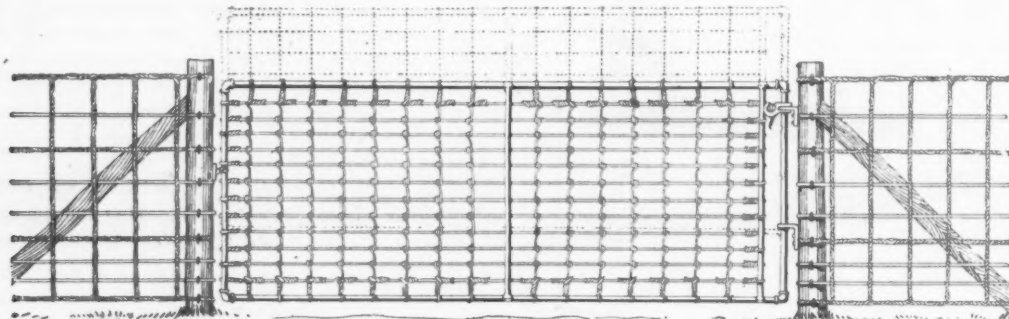


Fig. 2.—Wrench for Wing Screw Calks.

7 and 8 are for use by ice cutters, log peelers, mountain climbers, laborers on embankments or for any purpose where a deep penetration is desired. The longer sizes may be used in the heel and the shorter sizes in the sole. It is explained that all sizes are made as hard as the required strength will permit, being hard enough to wear well on rocks and yet sufficiently tough to stand a hard kick without breaking. They are packed 50 calks and a wrench to a box, 10 boxes to a carton. The company furnishes a neat leather covered velvet lined sample case with hinged cover, containing a leather strip in which is inserted one of each size of the calks, with the size numbers stamped on the leather. The case also contains a complete wrench, the whole making an attractive and convenient outfit. The wrench is so arranged that it may be used in a bit brace.

Ajax Field Fence Gate.

The Rochelle Wire Mfg. Company, Rochelle, Ill., has brought out the field fence gate here illustrated. The gate frame is made of 1-in. pipe, covered with heavy mesh wire, and is described as being rigidly constructed with a view to withstanding the heavy strain and wear incident to such service. Particular attention is invited to the provision made for raising and lowering the gate. The hinge used, as will be noted by reference to the illustration, is of a pattern that allows the gate to be raised to a height of 21 in., and it is securely held at interme-



Ajax Field Fence Gate.

mediate points in this distance by the binding action of the top hinge. The dotted lines in the illustration show the position of the gate when raised to its top limit of 21 in. The advantage of this arrangement is apparent in that it allows the gate to swing over obstacles, such as drifted snow or uneven ground, thus avoiding needless strain. To raise or lower the gate the small lever on the top hinge is pressed back until its grip on the frame post is disengaged; then by slightly raising the front end of the gate it can be raised or lowered into the next succeeding notch. In erecting the posts they should be set 3 in. farther apart than the width of the gate and the lower hinge should be placed 21 in. from the ground, while the upper hinge is secured to the top of the frame post when the bottom of the gate is 2 in. from the ground. All standard gates are made 50 in. high, the adjustable patterns being from 10 to 14 ft. in width.

The Jointless Refrigerator.

As the name suggests the line of refrigerators built by the Jointless Refrigerator Mfg. Company, Milwaukee,

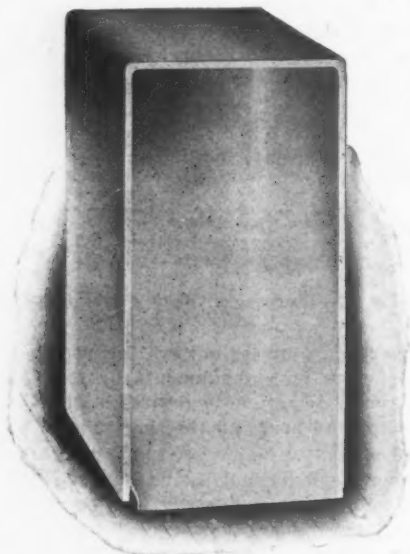


Fig. 1.—Lining of Jointless Refrigerator.

Wis., are constructed with seamless interior walls. The linings are molded in one piece, like a bathtub, and are finished inside with a smooth white enameled surface. Fig. 1 represents the lining as it comes from the molds

before being fitted in the wooden case. The advantages claimed for this form of construction are immunity from leakage into the surrounding insulation and the absence of cracks, angular corners and crevices that invite the lodgment of dust, dirt and mildew, giving rise to unpleasant odors and unsanitary conditions. The rounded corners facilitate cleaning of the interior. The linings are not metallic, but are made of a hard stonelike composition, which is at once impervious to moisture and a nonconductor of temperature. A finished refrigerator designated as No. 40, shown in Fig. 2, is described as being built of thoroughly seasoned selected oak lumber,

the doors being lined with solid slabs covered with enamel and fitted with heavy solid brass nickel plated hinges and locks, the latter insuring tight and secure closure of the door by simply pressing down the lock lever. It is stated that the material used for enameling contains no white lead, oil or turpentine, and the contents are therefore free from danger of taint that might come from the use of such ingredients. To insure perfect circulation of dry air the ice pan is suspended and completely surrounded



Fig. 2.—Jointless Refrigerator No. 40.

by an air space, and to the same end wire shelving is used, which besides offering no obstruction to the circulation of air is easily removed and cleaned. The refrigerators are provided with a self-closing drip cup with an apron front to allow the use of a large drip pan. All of the interior fittings are of galvanized steel. The open refrigerator shown in Fig. 2 is of the following dimensions, which are extreme outside measurements, including casters: Height, 62 in.; width, 29 in.; depth, 23 in.; ice chamber, 15½ x 24 x 18 in.; provision chamber, 32 x 24 x 18 in.; ice capacity, 125 lb., and shipping weight, 415 lb. Besides its regular line of household refrigerators the company manufactures linings and fittings for built in refrigerators, which will be shipped so that they can be put in by local carpenters.

Boss Adjustable Hook Huskers.

The Boss Mfg. Company, Kewanee, Ill., which makes a large line of husking pins, hooks, glove combinations and wrist bands, has brought out the two new patterns



Fig. 1.—Single Adjustable Hook Husker No. 48.

of hook huskers herewith illustrated. Fig. 1 represents a single hook husker, which is catalogued as style 48. It has a wide wrist band of sufficient length to fasten twice around the wrist, which together with the palm piece is made of heavy chrome leather and is fastened with nickel plated buckles. The heavy steel plate attached to the palm is nickel plated and polished, and

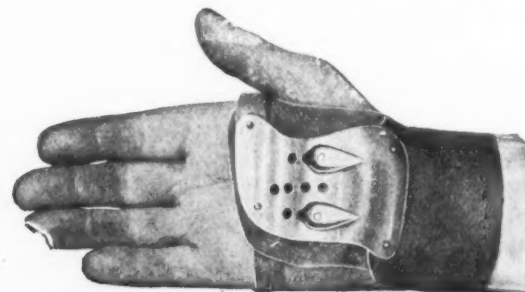


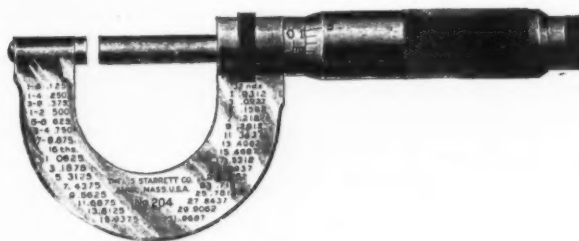
Fig. 2.—Double Adjustable Hook Husker No. 54.

carries a single hook. The chief feature of these huskers is the provision made for the adjustment of the hook to different positions by means of perforations in the plate. It can thus be changed to any position desired. The hook is stiffened to prevent bending by a corrugation running across the top. Style 54 is shown in Fig. 2 and has a leather piece of the same material and similar con-

struction as Fig. 1, except the wrist band is extra wide. The metal plate carries twin spurs, which are adjustable to 14 positions. The fastenings consist of three straps, with nickel plated buckles. These huskers are packed one dozen in a box.

Quick Adjusting Micrometer.

The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, has put on the market the Quick Adjusting micrometer, here illustrated. The notable feature of the tool is the rapidity with which it can be opened or closed to any point within its capacity of 1 in., without, it is asserted, impairing its accuracy or sensitiveness. This advantage is apparent when it is realized that 40 complete revolutions of the screw



Quick Adjusting Micrometer.

must be made to open or close an ordinary 1-in. micrometer its full length, consuming in time approximately 20 sec. In manipulating this micrometer a finger pressure against the end of the plunger immediately releases the nut, disengaging it from the screw, when any adjustment within an inch may be instantly made. Discontinuing the pressure causes instant engagement of nut with screw, when fine adjustments may be made in the customary way. This micrometer likewise has the Starrett patented sleeve and new lock, as well as the ratchet stop, the latter, it will be recalled, serving to prevent injury to the tool from turning too strongly on the article being measured, as the knurled thumb piece begins to ratchet as soon as contact occurs. Two styles of the Quick Adjusting micrometer are made, both of 1 in. capacity, No. 204 recording by thousandths and No. 205 by ten thousandths of an inch. The micrometers are sent singly in leatherette cases at a slight additional charge for case.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

Oil	Price
Linseed, State and Western, raw, in bbls.	39 @ 40
City, Boiled, in bbls.	43 @ 44
City, Raw, in bbls.	42 @ 43
Raw, Calcutta, in bbls.	70 @
Lard, Prime, Winter.	65 @ 70
Extra No. 1.	55 @ 57
No. 1.	47 @ 52
Cotton-seed, Crude, f.o.b. mill.	34 @ 35
Summer Yellow, prime.	43 @ 44
Summer White.	45 @ 46
Yellow Winter.	45 @ 45 1/2
Tallow, Acidless.	53 @ 55
Menhaden, Brown, Strained.	40 @
Light Strained.	40 @
Northern.	40 @
Southern.	40 @
Cocoonut, Ceylon.	6 @ 6 1/2
Cochin.	8 @ 8 1/2
Cod, Domestic, Prime.	42 @ 44
Newfoundland.	44 @ 46
Red, Elaine.	38 @ 40
Saponified.	10 @ 11 1/2
Olive, Yellow.	67 @ 69
Neatsfoot, Prime.	55 @ 58
Palm, Lagos.	10 @ 11 1/2

Mineral Oils—

Oil	Price
Black, 29 gravity, 25 @ 30 cold test.	13 @ 13 1/2
29 gravity, 15 cold test.	13 1/2 @ 14
Summer.	12 1/2 @ 13
Cylinder, light filtered.	20 1/2 @ 21
Dark, filtered.	18 @ 19
Paraffine, 903-907 sp. gravity.	14 1/2 @ 15
903 sp. gravity.	13 1/2 @ 14
885 sp. gravity.	11 @ 11 1/2
Red.	13 1/2 @ 14

Miscellaneous—

Material	Price
Barytes:	
White, Foreign.	10 @ 11.50 @ 20.50
Amer. floated.	10 @ 11.00 @ 20.00
Off color.	10 @ 11.00 @ 16.50

Material	Price
Chalk, in bulk.	3.00 @ 3.40
China Clay Imported.	11.50 @ 18.00
Cobalt, Oxide.	100 lb. 1.45 @ 2.60
Whiting, Commercial.	100 lb. .42 @ .52
Gilders.	100 lb. .55 @ .60
Ex. Gilders.	100 lb. .60 @ .65

Putty, Commercial—

Putty	Price
In bladders.	1.70 @ 1.85
In bbls. or tubs.	1.20 @ 1.45
In 1 lb to 5 lb cans.	2.65 @ 2.95
In 12 1/2 to 50 lb cans.	1.50 @ 1.90

Spirits Turpentine—

Spirit	Price
In Oil bbls.	49 1/2 @
In machine bbls.	50 @

Glue—

Glue	Price
Cabinet.	12 @ 15
Common Bone.	7 1/2 @ 9
Extra White.	18 @ 24
Fish, liquid, 50 gal, bbls., per gal.	
Ion.	60 @ 1.20
Foot Stock, White.	12 @ 14
Foot Stock, Brown.	9 @ 11
German Common Hide.	10 @ 12
French.	12 @ 18
Irish.	13 @ 16
Low Grade.	10 @ 12
Medium White.	14 @ 17

Gum Shellac—

Gum	Price
Bleached, Commercial.	20 @
Pure Dry.	25 @
Button.	30 @ 40
Diamond I.	47 @ 48
Fine Orange.	20 @ 32
A. C. Garnet.	23 @ 24
G. A. L.	18 @ 19
Kala Button.	17 @ 18
D. C.	48 @ 49
Octagon B.	38 @
T. N.	22 @ 23
V. S. O.	47 @ 48

Colors in Oil—

Color	Price
Black, Lampblack.	12 @ 14
Blue, Chinese.	36 @ 46
Blue, Prussian.	32 @ 36
Blue, Ultramarine.	13 @ 16
Brown, Vandyke.	11 @ 14
Green, Chrome.	12 @ 16
Green, Paris.	21 @ 24
Sienna, Raw.	12 @ 15
Sienna, Burnt.	12 @ 15
Umber, Raw.	11 @ 14
Umber, Burnt.	11 @ 14

White Lead, Zinc, &c.—

Material	Price
Lead, English white, in Oil.	10 1/2 @ 10 3/4
Lead, American White:	
Lots of 500 lb or over, in Oil.	6 1/2 @ 7 1/2
Lots less than 500 lb, in Oil.	7 1/2 @ 8 1/2
Lead, White, in oil, 25 lb tin.	7 1/2 @ 8 1/2
Lead, White, in oil, 12 1/2 lb tin.	7 1/2 @ 8 1/2
Lead, White, in oil, 1 to 5 lb.	8 1/2 @ 9 1/2
Lead, American, Terms: On lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry—

Zinc	Price
American, dry.	5 1/2 @ 5 3/4
Red Seal (French process).	6 1/2 @ 7
Green Seal (French process).	7 1/2 @ 8
German Red Seal (French process).	6 1/2 @ 7
Green Seal.	7 1/2 @ 8
White Seal.	7 1/2 @ 8
French, Red Seal.	8 1/2 @ 9
Green Seal.	10 1/2 @ 11

Dry Colors—

Dry Color	Price
Black, Carbon.	6 1/2 @ 7
Black, Drop, American.	3 1/2 @ 4
Black, Drop, English.	5 @ 6
Black, Ivory.	16 @ 20
Lamp, commercial.	4 @ 6

Color	Price
Blue, Celestial.	4 @ 6
Blue, Chinese.	31 @ 33
Blue, Prussian.	29 @ 31
Blue, Ultramarine.	3 1/2 @ 4
Brown, Spanish.	1 1/2 @ 2
Carmine, No. 40.	3 1/2 @ 4
Green, Chrome, ordinary.	17 @ 25
Green, Chrome, pure.	17 @ 25
Lead, Red, bbls., 1/2 h's, kegs.	6 1/2 @ 6 3/4
Litharge, bbls., 1/2 h's, kegs.	6 1/2 @ 6 3/4
Ocher, American.	10 @ 11.50 @ 16.00
American Golden.	2 1/2 @ 3 1/2
French.	1 1/2 @ 2
Foreign Golden.	3 @ 4
Orange Mineral, English.	10 @ 11
French.	12 1/2 @ 13
German.	10 @ 11
American.	8 1/2 @ 9 1/2
Red, Indian, English.	4 1/2 @ 6
American.	3 @ 3 1/2
Red, Turkey, English.	4 @ 10
Red, Tuscan, English.	7 @ 10
Red, Venetian, Amer.	10 @ 11.50 @ 12.50
English.	10 @ 11.50 @ 12.50
Sienna, Italian, Burnt and Powdered.	3 @ 9
Italian, Raw, Powdered.	3 @ 7
American, Raw.	1 1/2 @ 2
American Burnt and Pow'd.	1 1/2 @ 2
Talc, French.	10 @ 11.50 @ 25.00
American.	10 @ 11.50 @ 25.00
Terra Alba, French.	100 lb. .90 @ 1.00
English.	100 lb. .80 @ 1.00
American.	100 lb. .75 @ 1.00
American.	100 lb. No. 2. .60 @ .85
Umber, T'key, Bnt. & Pow.	2 1/2 @ 3
Turkey, Raw and Powdered.	2 1/2 @ 3
Burnt, American.	1 1/2 @ 2
Raw, American.	1 1/2 @ 2
Yellow Chrome, Pure.	13 @ 15
Vermilion, American Lead.	7 @ 25
Quicksilver, bulk.	65 @
Quicksilver, bags.	66 @
English, Imported.	65 @ 70
Chinese.	30.90 @ 1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33% @ 33% & 10% signifies

that the price of the goods in question ranges from 33% per cent. discount to 33% and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33%
Nott's.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See Caps, Cartridges, Shells, &c.

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, # doz. pairs, Nos. 1, \$0.75; 2, \$0.60; 4, \$1.00; 5, \$0.50.
Fernald Quick Shifter, # doz. pairs.....\$2.00@3.00

Anvils—American—

Eagle Anvils.....# lb. @8%
Hay-Budden, Wrought.....# lb. @9%
Trenton.....# lb. @9%
Swedish Solid Steel Sisco, Superior, # lb.....10@10%
Peter Wright & Sons, B. B. #4 to #10 lb. 11¢; #5 to #10 lb. 11%.

Imported—

Swedish Solid Steel Sisco, Superior, # lb.....10@10%
Peter Wright & Sons, B. B. #4 to #10 lb. 11¢; #5 to #10 lb. 11%.

Anvil, Vise and Drill—

Milners Falls Co. #18.00.....15@10%

Apple Parers—See Parers.

Aprons, Blacksmiths—

Livingston Nail Co.....10%

Augers and Bits—

Com. Double Spur.....75@10@80%
Jennings' Pat. W. Bright 1.65@10@70%
Black Lip or Blud.....65@65%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40@10%
Ford's Auger and Car Bits.....40@5%
Ft. Washington Auger Co., Concord's.....35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list.....25@7%
No. 30, R. Jennings' list.....50%
Russell Jennings.....25@10@2%
L'Houmeu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings Pattern.....20%
Snell's Auger Bits.....20%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....60%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's Patent, No. 1, # doz. \$28; No. 2, \$18.....60@10%
Ford's, Clark's Pattern.....66@5%
C. E. Jennings & Co., Steer's Pat. 25%
Larigine Pat. small size, \$18.00; large size, \$26.00.....60@10%
Swan's.....60%

Gimlet Bits—

Common Dble. Cut.....\$3.00@3.25
German Pattern, Nos. 1 to 10, \$1.75; 11 to 13, \$5.75

Hollow Augers—

Bonney Pat., per doz. \$6.50@7.00
Almes.....25@10%
Universal.....20%
Ford's.....33%
C. E. Jennings & Co.:
L'Houmeu's.....6%
Watrous'.....37%
Snell's.....44%

Awl Harts—See Handies,

Mechanics' Tool.

Awls—

Brad Awls:
Handled.....gro. \$2.75@3.00
Unhanded, Shlided.....gro. \$0.63@0.66
Unhanded, Patent.....gro. \$0.60@0.70

Peg Awls—

Unhanded, Patent.....gro. \$1@1.14
Unhanded, Shlided.....gro. \$0.65@0.70

Scratch Awls—

Handled, Com.....gro. \$3.50@4.00
Handled, Socket.....gro. \$1.50@2.00

Awl and Tool Sets—See

Sets, Awl and Tool.

Axos—

Single Bit, base weights: Per doz.
First Quality.....\$1.75@5.00
Second Quality.....\$1.25@1.50

Double Bit, base weights:
First Quality.....\$7.00@7.50
Second Quality.....\$6.50@6.75

Axle Grease—

See Grease, Axle

Axles—

Concord, Loose Collar.....4%
Concord, Solid Collar.....4%
No. 1 Common, Loose.....3%
No. 1 1/2 Com., New Style.....4%
No. 2 Solid Collar.....4%
Half Patent:
Nos. 7, 8, 11 and 12.....65@65%
Nos. 13 to 14.....65@65%
Nos. 15 to 18.....70@70%
Nos. 19 to 22.....70@70%

Boxes, Axle—

Common and Concord, not turned lb., 5@10¢
Common and Concord, turned lb., 6@7¢

Half Patent.....lb., 9%@10¢

Bait—

Fishing—

Hendryx:
A Bait.....20%
B Bait.....20%
Competitor Bait.....20%

Balances—

Sash—

Caldwell new list.....50%
Pullman.....50@10%

Spring—

Spring Balances.....50@10@60%

Chatillon's:
Light Spg. Balances.....50@50@10%
Straight Balances.....40@10@10%
Circular Balances.....50@10%
Large Dial.....30%

Barb Wire—See Wire, Barb.

Bars—

Crow—

Steel Crowbars, 10 to 40 lb. per lb., @2%
No. 10 Ideal, Nickel Plate, # gro. \$0.50

Beams, Scale—

Eale Beams.....40%
Chatillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered # doz. \$0.80; Tinned.....\$0.85
No. 11 Wire Coppered # doz. \$1.15; Tinned.....\$1.20
No. 10 Wire Tinned.....# doz. \$1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz. No. 5, Jap'd, \$0.80; No. A, Jap'd, \$1.15; No. B, Jap'd, \$1.85; No. 6, Jap'd, \$1.65.
Lyon, Jap'd, per doz., No. 2, \$1.35.

Taplin Mfg. Co.: Improved Dover, per gro. No. 60, \$5.00; No. 75, \$6.50; No. 100, \$7.00; No. 122, Tin'd, \$8.50; No. 150, Hotel, \$15.00; No. 152, Hotel Tin'd, \$17.00; No. 200, Tumbler, \$8.50; No. 202, Tumbler Tin'd, \$9.50; No. 300, Mammoth, per doz., \$25.00.

Turner & Seymour Mfg. Co.: T. & S. Dover.....\$6.50

Bellows—

Blacksmith, Standard List.

Split Leather.....60¢@65¢
Grain Leather.....50¢@50¢

Hand—

Inch. 6 7 8 9 10
Doz. \$5.00 5.50 6.00 6.50 7.50

Molders—

Inch. 10 12 14 16
Doz. \$7.50 9.00 11.00 15.00

Bells—

Cow—

Ordinary Goods.....75¢@75¢
High grade.....70¢@75¢
Jersey.....75¢@75¢
Texas Star.....50%

Door—

Home, R. & E. Mfg. Co.'s.....55@10%

Hand—

Polished, Brass.....50¢@10¢
White Metal.....50¢@10¢
Nickel Plated.....50¢@10¢
Sires.....50¢@10¢
Cone's Globe Hand Bells.....33%@35%

Expansion—

Richards Mfg. Co.....50@10%
Steward & Romaine Mfg. Co.
Style No. 13, Double.....55%
Style No. 1, Single.....55%
Style No. 100, Dbl. Jaw, Single.....50%
Lag Screw.....35%

Miscellaneous—

Farm Bells.....lb., 2%@2%
Church and School.....60@60%

Belting—

Leather—

Standard.....70¢@10¢
Light.....75¢@10%
Cut Leather Lacing.....50¢@10%
Leather Lacing Sides, per sq ft. 21@22¢

Rubber—

Competition (Low Grade), 70¢@10¢
Standard.....60¢@10%
Best Grades.....33%@40¢

Bench Stops—

See Stops, Bench

Benders and Upsetters,

Tire—

Green River Tire Benders and Upsetters.....20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks—

Tackle—

Common Wooden.....75¢@75%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50@10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50@10%; Wire Rope Snatch, 50%.

Laue's Patent Automatic Lock and Junior.....30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....55%
Embossed.....55%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....33%

Bolts—

Carriage, Machine, &c.—
Common Carriage (cut thread):
% x 6 and smaller.....75¢
Larger and longer.....70¢
Phila. Eagle, \$3.00 list.....80¢
Bolt Ends.....70¢
Machine (Cut Thread):
% x 4 and smaller.....75¢
Larger and longer.....70¢

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:
Inch. 3 4 5 6 8
Per doz. \$0.30 .35 .45 .60 .80

Cast Iron Spring Foot, Jap'd:
Inch. 6 8 10
Per doz. \$1.20 1.50 2.25

Cast Iron Chain, Flat, Japanned:
Inch. 6 8 10
Per doz. \$1.00 1.40 1.65

Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch. 6 8 10
Per doz. \$0.75 .95 1.25

Wrought Barrel Jap'd. 80@80¢
Barrel Bronzed.....60¢
Spring.....70¢@10¢
Shutter.....50¢@50¢
Square Neck.....75¢@75¢
Square.....70¢@10¢
Ives' Patent Door.....55%
Ives' Wrought Metal.....45%

Expansion—

Richards Mfg. Co.....50@10%
Steward & Romaine Mfg. Co.
Style No. 13, Double.....55%
Style No. 1, Single.....55%
Style No. 100, Dbl. Jaw, Single.....50%
Lag Screw.....35%

Plow and Stove—

Plow.....65¢@70%
Stove.....85¢@85%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct. 16, '84.....82%
Eagle.....82%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila., Eagle, list Oct. 16, 1884.....82%
Upon Nut Co.:
Tire Bolts.....72%

Borers, Bung—

Borers Bung, Ring, with Handle:
Inch. 1 1/4 1 3/4 2
Per doz. \$1.80 5.60 6.40 8.00

Per doz. \$1.80 5.60 6.40 8.00
Inch. 2 1/4 2 3/4 3
Per doz. \$3.65 11.50

Enterprise Mfg. Co. No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 25@10%; Langdon Acme.....15@10%
Perfection.....40%
Seavey.....45%

Braces—

Common Ball, American.....\$1.50
Barber's.....50¢@10¢
Fray's Genuine Spotted.....60%
Fray's No. 70 to 120, \$1 to 123, 207 to 411.....80%
C. E. Jennings & Co.....50¢
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat.....50%
Millers Falls Drill Braces.....25@10%
P. S. & W. Co., Peck's Pat.....60@10%

Brackets—

Wrought Steel.....70¢@10¢
Bradley Metal Clasp, 80@10¢
Griffin's Pressed Steel.....75¢@10¢
Griffin's Folding Brackets.....70@10%
Taplin Victor Handy Egg Beater Bracket.....# doz. \$1.50

Bright Wire Goods—

See Wire and Wire Goods.

Boilers—

Kilbourne Mfg. Co.....75@20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'g'r's list, price per gross.
Quart. 10 12 14
Water, Reg. 25.35 28.00 32.00
Water, Hvy. 45.35 48.00 52.00
Fire, Rd. Btm. 32.00 35.65 38.65
Well.....37.35 41.55 45.35

Bull Rings—See Rings, Bull

Butts—

Brass—

Wrought, High List, Oct. 26, '06.5%
Cast Brass, Tiebout's.....40%

Cast Iron—

Fast Joint, Broad.....40¢@10¢
Fast Joint, Narrow.....40¢@10¢
Loose Joint.....70¢@10¢
Loose Pin.....70¢@10¢
Mayer's Hinges.....70¢@10¢
Parliament Butts.....70¢@10¢

Wrought Steel—

Bright.

Light Narrow, Light Reversible.....70¢@5%
Reversible and Broad.....70¢@5%
Loose Joint, Narrow.....70¢@5%
Inside Blind, &c.....70%
Back Flaps, Table Chest, 65%
Japanned.
Light Narrow, Loose Pin.....40¢@5%
Light Narrow, Ball Tip.....40¢@5%
Broad.....40¢@5%
Steeple Tinned.....70%
Ball Tipped.....70%

Cages, Bird—

Henryx Brass: Series 3000, 5000,
1100, net list; 1200, 15%; 200, 300,
500
Henryx Bronze: Series 700, 800, 33%
Henryx Enamelled.....35%

Calipers—See Compasses.

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4 1/4 @ 4 1/2¢
Sharp, 1 prong, per lb., 4 1/2 @ 5 1/4¢
Burke's, Blunt 4 @ 1 1/4¢; Sharp, 4 @ 1 1/2¢
Lautier, Blunt, 4 @ 1 1/4¢; Sharp, 4 @ 1 1/2¢
Perkins, Blunt, 1 lb., 3.65¢; Sharp, 4.15¢

Can Openers—

See Openers, Can.

Caps, Percussion—

Eley's E. B. 52 @ 55¢
G. D. per M 3 1/2 @ 35¢
F. L. per M 4 @ 42¢
G. E. per M 4 @ 50¢
Musket per M 6 @ 63¢

Primers—

Berdan Primers, 2¢ per M. 2045%
Primer Shells and Bullets. 15¢ @ 10¢
All other primers per M. \$1.52 @ 1.60

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Blank Cartridges:
32 C. F., \$5.50 1045%
38 C. F., \$7.00 1045%
22 cal. Rim, \$1.50 1045%
32 cal. Rim, \$2.75 1045%
B. B. Caps, Can. Ball, Sngd. \$1.90
B. B. Caps, Round Ball \$1.40
Central Fire 85%
Target and Sporting Rifle. 1545%
Primed Shells and Bullets. 1545%
Rim Fire, Sporting 50%
Rim Fire, Military 1545%

Castors—

Bed 65¢ @ 10¢
Plate 60¢ @ 5%
Philadelphia 70¢ @ 10¢
Acme Ball Bearing 35%
Gem (Roller Bearing) 70¢ @ 10¢
Steel Gem 20%
Standard Ball Bearing 45%
Yale (Double Wheel) low list. 40¢ @ 10%

Cattle Leaders—

See Leaders, Cattle.

Chain, Proof Coil—

American Coil, Straight Link:
3-16 1/4 5-16 3/4 7-16 1/2 5%
\$8.15 5.55 4.60 3.95 3.75 3.65 3.55
3/4 1 1 1/4 1 1/2 1 3/4 inch.
\$3.45 3.55

In cash lots, deduct 25¢.

German Coil 60¢ @ 65%
German Pattern Coil:
6-0 to 1 70¢ @ 70¢ @ 10%
2 and 3. 80¢ @ 10¢ @ 60¢ @ 10¢ @ 5%
4, 5 and 6 50¢ @ 10¢ @ 50¢ @ 10%

Halter—

Halter Chains 60¢ @ 60¢ @ 5%
German Pattern Halter Chains,
list July 24, 97 60¢ @ 10¢ @ 5%
Covert Mfg. Co.
Halter 35¢ @ 5%

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6 1/2-6-3, Straight, with ring. \$28.00
6 1/2-6-2, Straight, with ring. \$29.00
6 1/2-8-2, Straight, with ring. \$32.00
6 1/2-10-2, Straight, with ring. \$37.00

NOTE—Add 2¢ per pair for Hooks
Twist Traces; add per pair for Nos. 2
and 3, 2¢; No. 1, 3¢; No. 4, 4¢ to price of
straight link.

Eastern Standard Traces, Wag-
on Chain, etc. 60¢ @ 10¢ @ 60¢ @ 10¢ @ 5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron 60¢ @ 10%
Brass 60%
Safety and Plumbers' Chain. 60¢ @ 10%

Gal. Pump Chain, 1 lb., 4 1/2 @ 15¢
Bridgeport Chain Co.
Triumph Halter and Coil. 35¢ @ 2¢ @ 10%
Triumph Dog 50¢ @ 10¢ @ 60%
Brown Halter and Coil. 45¢ @ 50¢ @ 5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stal-
lion 40%
Oneida Community:
American Halter, Dog and Kennel
Chains 35¢ @ 2¢ @ 10%
Niagara Dog Leads and Kennel
Chains 45¢ @ 50¢ @ 5%

Wire Goods Co.:
Dog Chain 70%
Universal Dbl.-Jointed Chain 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain 60%
Pullman:
Bronze Chain, 60%; Steel Chain,
Coppered 60¢ @ 10%
Sash Chain Attachments, per set. 8¢
Aluminum Sash Ribbon, per
ft. \$2.00 @ 35¢, 30¢
Sash Ribbon Attachments, per set. 8¢

Chalk—(From Jobbers.)

Carpenters' Blue gro., 50¢ @ 55¢
Carpenters' Red gro., 45¢ @ 50¢
Carpenters' White gro., 40¢ @ 45¢

Checks, Door—

Hardy's 45%
Pullman, per gro. \$5.00
Russell 35¢ @ 4%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools 50%
Youths' Chests, with Tools 35%
Gentlemen's Chests, w/Tools 25%
Farmers', Carpenters', etc., Chests,
with Tools 20%
Machinists' Pipe Fitters'
Chests, Empty 45%
Tool Cabinets 45%
C. E. Jennings & Co.'s Machinists'
Tool Chests 75%

Chisels—

Socket Framing and Firmer
Standard List 8¢ @ 10¢ @ 5%
Buck Bros. 30%
C. E. Jennings & Co.:
Socket Firmer No. 10 25¢ @ 7 1/2%
Socket Framing No. 15 25¢ @ 7 1/2%
Swan's 60¢ @ 70%
L. & I. J. White Co. 30¢ @ 40¢ @ 5%

Tanged—

Tanged Firmers 30¢ @ 35%
Buck Bros. 30%
C. E. Jennings & Co. Nos. 191, 181, 25%
L. & I. J. White Co. 25¢ @ 5%

Cold—

Cold Chisels, good quality. 13¢ @ 15¢
Cold Chisels, fair quality. 11¢ @ 12¢
Cold Chisels, ordinary 9¢ @ 10¢

Chucks—

Almond Drill Chucks 35%
Almond Turret Six-Tool Chuck 40%
Beach Pat., each \$8.00 35¢ @ 5%
Empire 25%
Blacksmiths' 25%
Jacobs' Drill Chucks 25%
Pratt's Positive Drive 25%
Skinner Patent Chucks:
Independent Lathe Chucks 35%
Universal, Reversible Jaws 35%
Combination, Reversible Jaws 35%
Drill Chucks, New Model, 25%
Standard, 45%; Skinner Pat., 25%
Positive Drive 40%
Planer Chucks 30%
Face Plate Jaws 35%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination Nos. 1, 2, 3, 4, 5, 6,
7, 8 and 17, 40%; No. 21 35%
Scroll Combination, Nos. 83 and
84 35%
Geared Scroll, Nos. 33, 34 and 35, 25%
Independent Iron, Nos. 19 and 318, 30%
Independent Steel, No. 61 25%
Union Drill, Nos. 000, 00, 100, 101,
102, 103, 104 35%
Union Gear Drill 25%
Universal, 11, 12, 16, 17, 13, 14, 15, 40%
Universal, No. 42 35%
Iron Face Plate Jaws, Nos. 28, 30,
48 and 50 35%
Steel Face Plate Jaws, Nos. 70 and
72 30%
Westcott Patent Chucks:
Lathe Chucks 50%
Little Giant Auxiliary Drill 50%
Little Giant Double Grip Drill 50%
Little Giant Drill, Improved 50%
Oneida Drill 50%
Scroll Combination Lathe 50%
Whitaker Mfg. Co.:
National Drill 25%

Clamps—

Adjustable Hammers 20¢ @ 25%
"Clinging" Makers' P. & W.
Co. 50¢ @ 10%
Resly, Parallel 35¢ @ 10%
Myers' Hay Rack 45%
Lineman's Swedish Neverturn 65%
Wood Workers' Hammers 40¢ @ 10%
Saw Clamps, see Vises, Saw Filers.

Cleaners, Drain—

Iwan's Champion, Adjustable 50%
Iwan's Champion, Stationary 40%

Sidewalk—

Star Socket, All Steel, 9 doz. \$1.05 net
Star Shank, All Steel, 9 doz. \$3.24 net
W. & C. Shank, All Steel, 9 doz.,
7 1/2 in., \$3.00; 8 in., \$3.25.

Cleavers, Butchers'—

Foster Bros. 30%
Fayette R. Plumb 30%
L. & I. J. White Co. 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each, \$10.75
20th Century Horse, each, \$5.00
Lightning Belt Horse, each, \$15.00
Chicago Belt Horse, each, \$20.00
Stewart's Enclosed Gear
Horse, each \$4.75
Stewart's Patent Sheep Shear-
ing Machine, each \$12.75
Stewart's Enclosed Gear Shear-
ing Machine, No. 8, each, \$3.75

Clips, Axle—

Regular Styles, list July 1, '05,
80¢ @ 60¢ @ 10%

Cloth and Netting, Wire—

—See Wire, &c.

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene,
Racking, Liquor, Bottling,
etc. 75%
Compression Bibbs 70%

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens &
Son's list 40%
Leather, Walter B. Stevens & Son's
list 40%

Compasses, Dividers, &c.—

Ordinary Goods 70¢ @ 10¢ @ 75%
Wm. Schollhorn Co.:
Excelsior Dividers 60%
Lodi Dividers 70¢ @ 10%

Conductor Pipe,—

Gal. Steel, Charcoal.
L. C. L. to Dealers:
Eastern 70¢ @ 10% 50¢ @ 10¢ @ 2 1/2%
Pittsburgh 75¢ @ 10¢ @ 5%
Central 75¢ @ 10% 60%
Northwestern 75¢ @ 10% 60%
Western 70¢ @ 12 1/2% 50¢ @ 12 1/2%
Tennessee 70¢ @ 10% 50¢ @ 12 1/2%
Southern 70% 50¢ @ 12 1/2%
Southwestern 70% 50¢ @ 5%

Terms, 60 days; 2% cash 10 days. Fac-
tory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:
Gal. 2 3 4 6 8
Galvanized, ea. \$1.85 \$2.00 \$2.25 \$2.30 \$3.00
Galvanized, Lined, side handles, "
Gal. 2 3 4 6 8
Each \$1.95 \$2.15 \$2.40 \$3.30 \$1.15
White Enamelled 10%
Agate Lined 10%

Coopers' Tools—

See Tools, Coopers'.

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair
and heavier, 22¢ @ 25¢; lighter
than 3 lb. to pair 24¢ @ 27¢

Cord— Sash—

Braided, Drab lb. 35¢
Braided, White, Com., Nos. 8
to 12, 21¢; No. 7, 21¢; No.
6, 22¢ @ 4¢. In lots of 12 doz. or
over, 1 cent less per pound.
Cable Laid Italian, lb. No. 18, 37¢
Italian, lb. A. No. 18, 25¢; B, 22¢
Common India lb., 11¢ @ 11 1/2¢
Cotton Sash Cord, Twisted, 18 @ 20¢
Patent Russia lb. 20¢
Cable Laid Russia lb. 21¢
India Hemp, Br'd'd lb. 21¢
India Hemp, Twisted, lb. 13¢ @ 14¢
Patent India, Twisted, lb. 17¢
Pearl Braided, cotton, No. 6, 3¢ lb.
27 1/2¢; No. 7, 26 1/2¢; Nos. 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12,
26¢; 7, 26 1/2¢; 6, 27 1/2¢.
Harrison Cable Laid Italian, Nos. 7
to 10 19¢
Pullman:
Wire Sash Cord 10%
Sash Cord Attachments, per 100, \$2.00
Samson, Nos. 8 to 12:
Braided, Drab, Drab Cotton,
55¢; Italian Hemp, 40¢ @
50¢; Linen, 65¢; White Cot-
ton, 50¢; Spot Cord 50¢
Massachusetts, White lb 40¢
Massachusetts, Drab lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, 35¢; B. White, 40¢;
A. Drab, 45¢; B. White, 35¢;
Italian Hemp, 40¢; Linen 57 1/2¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906 90¢ @ 10%
Henryx standard Wire Picture Cord,
old list, 85¢ @ 10%
Turner & Stanton Co. Wire Picture
Cord 85¢ @ 10%

Cradles—

Grain 40¢ @ 12 1/2%

Crayons—

White Round Crayons, Cases, 100
gro., \$6.50 @ \$7.50 at factory, but
lower prices made by jobbers
Zelicker's Lumber, 9 gro.
White and Purple, Indelible, \$7.50
Blue, Red, Green, Yellow and
Terra Cotta, \$6.50; Black \$4.50
Giant Lumber, 5 1/2 in. x 15-16 in.
round, all colors, \$12.00; Indel-
ible, \$14.00; Blacks \$10.00
Genuine Soapstone, Metal Workers'
5 in. x 1 1/2 in. Round, \$2.50; 5 in. x
1 1/2 in. Square, \$1.75; 5 x 1 1/2 x 3-16,
\$2.50; 5 x 1 1/2 x 3-16 \$3.00

Crooks, Shepherds'—

Fort Madison, per doz. Heavy, \$5.00;
Light \$5.00

Crow Bars—See Bars, Crow.

Cultivators—

Victor Garden 50%

Cutlery, Table—

International Silver Company:
No. 12 M d m Knives, 1917, 9 doz. \$3.50
Star, Eagle, Rogers & Hamilton
and Anchor 9 doz. \$3.00
Wm. Rogers & Son 9 doz. \$2.50

Cutters— Glass—

H. H. Mayhew Co. 40%
Red Devil 60%
B. Mfg. Co. 40%
Woodward 50%

Meat and Food—

American 30%
Nos. 401 402 403 404 405 406 407
Each \$5 \$7 \$10 \$12 \$25 \$50 \$60
Enterprise:
Nos. 5 10 12 22 32
Each \$2 \$3 \$2.75 \$1.50 \$6 \$25 @ 25¢ @ 7 1/2%
No. 202, \$1.50 40¢ @ 7 1/2%
P. S. & W. Co.:
Dixon's 9 doz. 33 1/4%
Nos. 2 4
\$14.00 \$17.00 \$19.00 \$30.00
Ideal 40¢ @ 10¢ @ 5%
Hales 60¢ @ 10¢ @ 5%
Little Giant 9 doz. 40¢ @ 50%
Nos. 305 310 312 320 322
\$35.00 \$48.00 \$14.00 \$72.00 \$68.00
New Triumph No. 605, 9 doz. \$24.00,
40¢ @ 10%
Russwin Food, No. 1, \$24.00; No. 2,
\$27.00 45¢ @ 10¢ @ 10%
Enterprise Beef Shavers 25¢ @ 30%

Slaw and Kraut—

Henry Diston & Sons:
Slaw and Kraut Cutters 35%
Corn Graters 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife 9 doz. \$3.00
Combined Slaw Cutter and Corn
Grater 9 doz. \$1.00

Tobacco—

All Iron, Cheap doz. \$1.25 @ \$1.50
Enterprise 35¢ @ 30%
National, 9 doz., No. 1, \$21; No. 2,
\$18 40%

Diggers, Post Hole, &c.—

Diston's:
Rapid, 9 doz., \$24.00 25%
Samson, 9 doz., \$34.00 25%
Iwan's Improved Post Hole Auger, 40%
Vaughan Pattern Post Hole Augers,
9 doz., \$7.00
Perfection Post Hole Diggers, 9
doz., \$8.75
Split Handle Post Hole Diggers,
9 doz., \$7.75
Hercules Pattern, 9 doz., \$10.00
Kohler's, 9 doz., Universal, \$15.00;
Little Giant, \$12.00; Hercules,
\$10.00; Invincible, \$9.00; Rival,
\$8.50; Pioneer \$7.50
Never-Break Post Hole Diggers, 9
doz., \$24.00 60%

Dividers—See Compasses.

Drawing Knives—

See Knives, Drawing.

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers 35%
Sterling Wheel Dresser Cutters 35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling
Machines \$1.50 @ \$1.75
Breast, Millers Falls 10¢ @ 10%
Breast, P. S. & W. 30¢ @ 10%
Goodell Automatic Drills, 50¢ @ 10¢ @ 10%
Millers Falls Automatic Drills, 33¢ @ 10%
Ratchet, Curtis & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Weston's 40%
Ratchet, Weston's, Style H Im-
proved 40%
Ratchet, No. 012 40%
Ratchet, Celebrated 40%
Ratchet, Whitney's, P. S. & W. 50¢ @ 5%
Whitney's Hand Drill, No. 1, \$10.00;
Adjustable, No. 10, \$12.00 33 1/2%

Twist Drills—

Bit Stock 70¢ @ 70¢ @ 5%
Taper and Straight Shanks 60¢ @ 10¢ @ 70%

Drivers, Screw—

Screw Driver Bits, per doz. 45¢ @ 50¢
Balsey's Screw Holder and Driver, 9
doz., 2 1/2 in., \$6; 4 in., \$7.50; 6 in.,
\$9
Buck Bros.' Screw Driver Bits 50%
Champion 50%
Diston's 70%
Fray's Hol. H'dle Sets, No. 3, \$12.50
Ford's Brace Screw Drivers 40¢ @ 10%
Gay's Double Action Ratchet 35%
Goodell's Auto 65¢ @ 65¢ @ 10%
Mayhew's Black Handle 40%
Mayhew's Monarch 40%
Millers Falls, Nos. 20 and 21 25¢ @ 10%
Millers Falls, Nos. 11, 12, 41, 42, 15¢ @ 10%
Smith & Hemenway Co. Never-
turn, 66%; Elmora, 60%; Star,
30¢ @ 10%

Ewan's:
Nos. 7565 to 7568, 50%; No. 7540,
40¢ @ 10%

Eave Trough, Galvanized—

Territory.	Gal. Steel.	Charcoal	Iron.
Eastern	75¢ @ 10¢ @ 5%	65¢ @ 20%	65¢ @ 10%
Pittsburgh	80¢ @ 20%	65¢ @ 10%	65¢ @ 10%
Central	80¢ @ 10¢ @ 10¢ @ 2 1/2%	65¢ @ 10%	65¢ @ 10%
Northwestern	80¢ @ 10¢ @ 10¢ @ 10%	65¢ @ 10%	65¢ @ 10%
Western	80¢ @ 10%	60¢ @ 10¢ @ 5%	60¢ @ 10¢ @ 5%
Tennessee	80¢ @ 5%	60¢ @ 10¢ @ 5%	60¢ @ 10¢ @ 5%
Southern	80%	60¢ @ 10¢ @ 5%	60¢ @ 10¢ @ 5%
Southwestern	75¢ @ 10¢ @ 2 1/2%	60¢ @ 5%	

Terms.—2% for cash. Factory ship-
ments generally delivered.

N. E.—Lower prices are made in
some sections.

See also Conductor Pipe and Elbows

Elbows and Shoes—

Factory ship ments, all territories:
Galv. Steel and Galv. C.
Standard Gauge 85¢ @ 85¢ @ 10%
No. 26 25%
No. 21 25%
No. 22 10%

Elbows, Stove Pipe—

Edwards, Standard Blue 40¢ @ 10¢ @ 10%
Edwards, Royal Blue 40¢ @ 10¢ @ 10%
Reeves, Dover,

Fasteners, Blind—

Zimmerman's 50¢10¢
 Walling's 40¢10¢
 Upson's Patent 40¢

Cord and Weight—

Ives and Titan 33½¢

Corrugated—

Acme Corrugated Pasture, 70¢

Faucets—

Cork Lined 50¢10¢60¢
 Metallic Key, Leather Lined, 60¢10¢70¢

Red Cedar 40¢5¢10¢45¢
 Petroleum 70¢10¢75¢

B. & L. B. Co. 80¢10¢
 Metal Key 60¢

West Lock 80¢10¢
 John Sommer's Peerless Tin Key 40¢

John Sommer's Boss Tin Key 40¢
 John Sommer's Victor Mtl. Key 50¢10¢

John Sommer's Duplex Metal Key 40¢
 John Sommer's Diamond Lock 40¢

John Sommer's L. Y. L. Cork Lined 50¢
 John Sommer's Reliable Cork Lined 50¢10¢

John Sommer's Chicago Cork Lined 40¢
 John Sommer's O. K. Cork Lined 40¢

John Sommer's No. Brand, Cedar 40¢
 John Sommer's Perfection, Cedar 40¢

Self Measuring:
 Enterprise, ½ doz. \$36.00 40¢10¢

Lane's, ½ doz. \$36.00 40¢10¢
 National Measuring, ½ doz. \$36.00 40¢10¢

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899.

Best Brands 70¢10¢75¢10¢
 Standard Brands 75¢10¢80¢

Lower Grade 75¢10¢10¢80¢10¢

Imported—

Stubs' Tapers, Stubs' List, July 24, '97 35 1-5 40¢

Fixtures, Fire Door—

Allith Underwriters' Approved 50¢

Acme Mfg. Co. No. 103; Special, No. 104 \$3.75

Fusible Links, No. 36 50¢

Expansion Bolts, No. 107 60¢10¢

Grindstone—

Net Prices:
 Inch 15 17 19 21

Per doz. \$3.60 3.85 4.15 4.65

P. S. & W. Co. 25¢

Reading Hardware Co. 60¢

Fodder Squeezers—

See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato 60¢10¢

Victor, Hay 60¢15¢2½¢

Victor, Manure 60¢

Victor, Header 60¢

Champion, Hay 60¢

Champion, Header 60¢

Champion, Manure 60¢15¢2½¢

Columbia, Hay 60¢20¢

Columbia, Manure 70¢

Columbia, Spading 70¢12¢

Hawkeye Wood Barley 40¢

W. & C. Potato Digger 60¢10¢

Acme Hay 60¢20¢

Acme Manure, 4 tine 60¢10¢5¢

Dakota Header 60¢20¢

Jackson Steel Barley 60¢20¢

Kansas Header 60¢

W. & C. Favorite Wood Barley 40¢

Plated.—See Spoons.

Frames— Wood Saw—

White, S't Bar, per doz. 75¢80¢

Red, S't Bar, per doz. \$1.00¢1.25

Red, Dbl. Brace, per doz. \$1.40¢1.50

Freezers, Ice Cream—

Qt. 1 2 3 4 6

Each \$1.25 \$1.60 \$1.90 \$2.20 \$2.80

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.**Fuse— Per 1000 Feet.**

Hemp \$2.75

Cotton 3.20

Waterproof Spl. Taped. 3.65

Waterproof Dbl. Taped. 4.40

Waterproof Tpl. Taped. 5.15

Gates, Molasses and Oil—

Stebbins' Pattern 80¢80¢65¢

Gauges—

Marking, Mortise, &c. 50¢50¢10¢

Chapin-Stephens Co.
 Marking, Mortise, &c. 50¢50¢10¢

Diston's Marking, Mortise, &c. 67½¢

Wire, Brown & Sharpe's 33½¢

Wire, Morse's 25¢

Wire, P. S. & W. Co. 33½¢

Gimlets— Single Cut—

Numbered assortments, per gro.

Natl. Metal, No. 1, 22.00; 2, 22.30

Spike, Metal, No. 1, 21.00; 2, 21.30

Natl. Wood Handled, No. 1, 22.30; 2, 22.60

Spike, Wood Handled, No. 1, 21.30; 2, 21.60

Class, American Window See Trade Report.

Glasses, Level— Chapin-Stephens Co. 65¢65¢10¢

Glue, Liquid Fish— Bottles or Cans, with Brush 25¢10¢10¢

Elwell's 50¢

Grease, Axle—

Common Grade gro. \$6.00¢6.50

Dixon's Everlasting, 10-lb pails, ea. 56¢; in boxes, ½ doz., 1 lb. \$1.20;

2 lb. \$2.00

Helmet Hard Oil 25¢

Griddles, Soapstone—

Pike Mfg. Co. 33½¢33½¢10¢

Grinders—

Royal Mfg. Co.
 Aluminum Grinding Machines, each,

Nos. 01, \$1.75; 1A, \$2.50; 10, \$5.00

Aluminum Sickle Grinders, each, Nos. 20, \$5.00; 20A, \$6.00; 20A Combined, \$6.50 30¢

Aluminum Disc Grinders, each, \$2.50 30¢

Grindstones—

Pike Mfg. Co.
 Improved Family Grindstones, 3½ inch, ½ doz. \$2.00 33½¢

Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted 40¢

Grips, Nipple—

Perfect Nipple Grips 40¢10¢2½¢

Halters and Ties—

Cow Ties 60¢5¢60¢10¢

Bridgeport Chain Co.
 Triumph Coil and Halters, 35¢2½¢40¢

Brown Coil and Halters 45¢50¢5¢

Brown Cow Ties 50¢50¢50¢10¢5¢

Brown Tie Outs 70¢10¢75¢5¢

Covert Mfg. Co.
 Web 30¢2½¢

Jute Rope 20¢

Sisal Rope 20¢

Cotton Rope 45¢

Hemp Rope 45¢

Oneida Community:
 Am. Coil and Halters 40¢40¢5¢

Am. Cow Ties 45¢60¢

Niagara Coil and Halters 45¢50¢5¢

Niagara Cow Ties 45¢50¢50¢10¢5¢

Hammers—**Handled Hammers—**

Heller's Machinists' 55¢10¢55¢10¢5¢

Heller's Farriers' 40¢5¢40¢10¢5¢

Peck, Stow & Wilcox Co.
 Crucible Steel 50¢

Farriers' 40¢10¢5¢

Riveting 50¢

Machinists', revised list 66¢5¢

Blacksmiths' 50¢5¢

Fayette R. Plumb:
 A. E. Nail 40¢2½¢40¢12½¢

Eng. and B. S. Hand 50¢10¢50¢60¢5¢

Machinists' Hammers 60¢60¢10¢

Rivet and Tinner's 40¢7½¢40¢12½¢5¢

Heavy Hammers and Sledges—

Under 3 lb., per lb. 50¢ 80¢10¢

3 to 5 lb., per lb. 40¢ 80¢10¢

Over 5 lb., per lb. 30¢ 80¢10¢

Over 5 lb., per lb. 30¢ 80¢10¢10¢

Handles—**Agricultural Tool Handles**

Are, Pick, &c. 60¢10¢60¢10¢5¢

Hoe, Rake &c. 40¢

Fork, Shovel, Spade, &c.:
 Long Handles 40¢

D Handles 40¢

Cross-Cut Saw Handles—

Atkins' 40¢

Champion 50¢

Diston's 50¢

Mechanics' Tool Handles—

Auger, assorted gro. \$3.00¢\$3.50

Brad Acl. gro. \$1.65¢\$1.75

Chisel Handles, Ass'd, per gro.:
 Tanged Firmer, Apple, \$2.40¢

\$2.65; Hickory \$2.15¢2.40

Socket Firming, Apple, \$1.75¢

\$1.95; Hickory \$1.60¢\$1.75

Socket Framing, Hickory, \$1.60¢\$1.75

File, assorted gro. \$1.30¢\$1.40

Hammer, Hatchet, &c. 60¢10¢60¢10¢5¢

Hand Saw, Varnished, doz. 80¢85¢; Not Varnished 65¢75¢

Plane Handles:
 Jack, doz. 30¢; Fore, doz. 45¢

Chapin-Stephens Co.
 Carving Tool 30¢30¢10¢

Chisel 60¢60¢10¢

File and Awl 60¢60¢10¢

Saw and Plane 30¢30¢10¢

Screw Driver 30¢30¢10¢

Millers Falls Adj. and Ratchet Auger Handles 15¢10¢

Nicholson Simplicity File Handle 15¢

J. L. Osgood:
 Indestructible File and Tool, ½ gro., No. 1, \$3.00; No. 2, \$3.50;

No. 3, \$3.00; No. 4, \$3.50; No. 5, \$10.00 gro. lots 10¢

W. A. Zelnicker Supply Co.:
 Hammer, ½ doz. 12 in. \$2.00;

14 in. \$2.00; 16 in. \$2.30; 18 in. \$2.50; 20 in. \$2.70; 22 in. \$3.00; 24 in. \$3.30; 26 in. \$3.50;

30 in. \$3.80;

Sledge, ½ doz., oval, 30 in. \$3.80; octagon, 30 in. \$3.80;

oval, 36 in. \$4.00; octagon, 36 in. \$4.00;

Axe, ½ doz., 28 to 34 in. \$5.00; 36 in. \$5.80;

Adze, ½ doz., 36 in. \$5.80; 36 in. \$7.20;

Pick, ½ doz., B. R. 36 in. \$8.00; coal, 34 in. \$5.80;

Hatchet, ½ doz., 12 to 14 in. \$2.00.

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:

Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50¢

Chicago Spring Butt Co.:

Friction 25¢

Oscillating 25¢

Big Twin 25¢

Chisholm & Moore Mfg. Co.:

Baggage Car Door 50¢

Elevator 50¢

Railroad 50¢

Cronk & Carrier Mfg. Co.:

Loose Axle 60¢2½¢

Roller Bearing 70¢2½¢

Griffin Mfg. Co.:

Solid Axle, No. 10, \$12.00. 60¢10¢

Roller Bearing, No. 11, \$15.00. 60¢10¢

Roller Bearing, Ex. Hy. No. 22, \$18.00. 60¢10¢

Bul. Dog, \$24.00 70¢

Lane Bros.:

Parlor, Ball Bearing, \$1.00; Standard, \$3.15; No. 105, \$2.85; New Model, \$2.80; New Champion \$2.25

Barn Door, Standard 60¢10¢

Hinged net \$6.08

Covered 60¢5¢

Special 70¢5¢

Lawrence Bros.:

Advance 55¢10¢

Cleveland 70¢7½¢

Clipper, No. 75 60¢

Crown 55¢10¢

Cyclone, No. 40 net \$6.50

Tandem, No. 50 net \$7.50

New York 55¢10¢

McKinney Mfg. Co.:

Roller Bearing, Nos. 1 and 2. 70¢

Anti-Friction 60¢

Hinged Hangers, King Charm. 60¢

Richards Mfg. Co.:

Hangers, Nos. 47, 48, 147, 247, 60¢5¢

Pioneer Wood Track, No. 3, \$2.25

Roller B'rg St'l Track No. 12, \$2.20

Roller B'rg St'l Track No. 13, \$2.50

Roller B'rg, Nos. 39, 41, 43, 70¢7½¢

Hero, Adj. Track No. 19, 50¢10¢

Adjustable Track Tandem Trolley Track No. 16 50¢10¢

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Cronk's Weeding, No. 1, \$2.00; No. 2, \$2.50
Star Double Bit.....\$3.20
Ft. Madison Cotton Hoe.....70¢&10¢
Ft. Madison Crescent Cultivator Hoe.....70¢&10¢
Ft. Madison Mattock Hoes:
Regular Weight.....\$ doz. 40¢&5¢
Junior Size.....\$ doz. \$4.00
Ft. Madison Sprouting Hoe.....70¢&10¢
Ft. Madison Dixie Tobacco Hoe.....75¢&10¢
Kretzinger's Cut Easy.....70¢&10¢
Warren Hoe.....75¢&10¢
W. & C. Lumberhoe.....75¢&10¢
B. B. 6 in. Cultivator Hoe.....\$3.40
B. B. 6 in. in.....\$3.50
Acme Weeding.....\$ doz. net. \$4.35
W. & C. Lumberhoe.....\$ doz. \$5.25

Hoisting Apparatus—

See Machines, Hoisting.

Holders—Bit—

Angular, \$ doz. \$24.00.....45¢&10¢
Bardley's, Iron, 40%; Brass and Bronze.....25¢
Empire.....60¢
Pullman.....25¢
Richards Mfg. Co., No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....35¢
Superior.....35¢

File and Tool—

Nicholson File Holders and File Handles.....35¢&40¢

Fruit Jar—

Triumph Fruit Jar Holder, \$ gross, \$10.80; \$ doz.....\$1.25

Trace and Rein—

Fernald Double Trace Holder, \$ doz. pairs.....\$1.25
Dash Rein Holder, \$ doz. pairs.....\$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....35¢

Hooks—Cast Iron—

Bird Cape, Reading.....40¢
Clothes Line, Reading List.....40¢
Coat and Hat, Reading.....45¢&20¢
Coat and Hat, Wrightsville.....60¢&5¢
Harness, Reading List.....40¢

Wire—

Belt.....80¢
Wire C. & H. Hooks.....80¢
Bradley Metal Clasp Wire, Coat and Hat, 70¢&10¢; Ceiling.....70¢&10¢
Columbian Hdw. Co., Gem.....70¢&5¢
Parker Wire Goods Co., King.....70¢&10¢
Wire Goods Co.:
Ame. 60¢&10¢; Chief, 70¢; Crown, 75¢; Czar, 55¢; V. Brace, 75¢; Czar, Harness, 50¢&10¢.

Wrought Iron—

Boz, 6 in., per doz., \$1.00; 8 in., \$1.25; 10 in., \$2.50.
Cotton.....\$ doz. \$1.05@1.15
Wrought Staples, Hooks, &c.—See Wrought Goods

Miscellaneous—

Hooks, Bench, see Stops, Bench.
Rush, Light, doz., \$6.20; Medium, \$6.75; Heavy, \$7.65
Grass, best, all sizes, per doz. \$3.00
Grass, common grades, all sizes, per doz.....\$1.50
Whiffletrees.....10¢
Hooks and Eyes:
Brass.....60¢&60¢&10¢
Malleable Iron.....70¢&70¢&10¢
Cores, Mfg. Co. Gate and Scuttle Hooks.....40¢
Ft. Madison Cut-Easy Corn Hooks.....\$ doz. \$3.25 net
Turner & Stanton Co. Cup and Shoulder.....80¢&10¢
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See Nails, Horse.

Horseshoes—

See Shoes, Horse.

Hose, Rubber—

Garden Hose, ¼-inch:
Competition.....ft. 5¢@6¢
3 ply Guaranteed.....ft. 8¢@9¢
4 ply Guaranteed.....ft. 10¢@11¢
Cotton Garden, ¼-in., coupled:
Low Grade.....ft. 8¢@9¢
Fair Quality.....ft. 10¢@11¢

Irons—Sad—

From 4 to 10.....lb. 8¢@3¢
B. B. Sad Irons.....lb. 3¢@3¢
Mrs. Potts', cents per set:
Nos. 50 55 60 65
Jap'd Tops.....83 80 93 91
Tin'd Tops.....88 85 98 95
New England Pressing.....lb. 3¢@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60¢&10¢; Corner.....60¢

Pinking—

Pinking Irons.....\$ doz. 80¢

Irons, Soldering

See Copiers.

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30¢&2¢; Steel, 45¢
Lane's Steel.....30¢
Richards' Tiger Steel, No. 130.....\$3.10
Smith & Hemenway Co.....25¢

Ladder—

Richards Mfg. Co., Ladder Jacks.....50%

Kettles—

Brass, Spun, Plain.....20¢&25¢
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—
Foster Bros' Butcher, &c.....30¢
Wilkinson Shear & Cutlery Co.....60¢

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60¢
Withington Acme, \$ doz. \$2.65;
Dent, \$2.75; Adj. Serrated, \$2.20;
Serrated, \$2.10; Yankee No. 1, \$1.50;
Yankee No. 2, \$1.15.

Drawing—

Standard List.....80¢&10¢—
C. E. Jennings & Co., Nos. 45, 46, 25¢&7½¢
Jennings & Griffin, Nos. 41, 42, 60¢&7½¢
Swan's.....66¢&70¢
Watrous.....16½¢
L. & J. J. White.....20¢&25¢

Hay and Straw—

Serrated Edge, per doz. \$5.50@5.75
Iwan's Sickle Edge.....\$ doz. \$9.50
Iwan's Serrated.....\$ doz. \$10.00

Miscellaneous—

Farriers'.....\$ doz. \$2.10@3.55
Wostenholme's.....\$ doz. 1.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip.....gro. \$1.25@1.40
Carriage, Jap., all sizes.....gro. 40¢@45¢

Door, Mineral.....\$ doz. 65¢&70¢
Door, Por. Jap'd.....\$ doz. 70¢&75¢
Door, Por. Nickel.....\$ doz. \$2.05@2.15
Bardley's Wood Door, Shutters, &c. 15¢

Lacing, Leather—

See Belting, Leather—

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Store.....25¢
Myers' Noiseless Store Ladders.....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladies, Melting—

L. & G. Mfg. Co. (low list).....20%
P. S. & W.....40¢&10¢
Reading.....60%

Lanterns—Tubular—

Regular, No. 0.....\$ doz. \$4.35@4.50
Side Lift, No. 0.....\$ doz. \$4.60@4.75
Hinge Globe, No. 0.....\$ doz. \$4.60@4.75
Other Styles.....40¢@40¢&10¢

Bull's Eye Police—

3-inch.....\$4.25@4.50

Latches—Thumb—

Roggan's Latches, with screw.....\$ doz. 35¢@40¢

Door—

Allith Mfg. Co., Reliable and Allegator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, \$ doz. \$2.00
Richards' Bull Dog, Heavy, No. 125.....50¢&5¢
Richards' Trump, No. 12.....\$1.50

Leaders, Cattle—

Small.....\$ doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See Pumps—

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos. 18 19 20
100 feet.....\$2.50 2.25 2.00
75 feet.....\$2.10 1.80 1.45

Union Cordage Works:
Solid Braided Chalk, Nos. 0 to 3, 40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, \$1.50; No. 1, \$1.50; No. 2, \$1.50; No. 3, \$1.50; No. 4, \$1.50; No. 5, \$1.50; No. 6, \$1.50; No. 7, \$1.50; No. 8, \$1.50; No. 9, \$1.50; No. 10, \$1.50; No. 11, \$1.50; No. 12, \$1.50; No. 13, \$1.50; No. 14, \$1.50; No. 15, \$1.50; No. 16, \$1.50; No. 17, \$1.50; No. 18, \$1.50; No. 19, \$1.50; No. 20, \$1.50; No. 21, \$1.50; No. 22, \$1.50; No. 23, \$1.50; No. 24, \$1.50; No. 25, \$1.50; No. 26, \$1.50; No. 27, \$1.50; No. 28, \$1.50; No. 29, \$1.50; No. 30, \$1.50; No. 31, \$1.50; No. 32, \$1.50; No. 33, \$1.50; No. 34, \$1.50; No. 35, \$1.50; No. 36, \$1.50; No. 37, \$1.50; No. 38, \$1.50; No. 39, \$1.50; No. 40, \$1.50; No. 41, \$1.50; No. 42, \$1.50; No. 43, \$1.50; No. 44, \$1.50; No. 45, \$1.50; No. 46, \$1.50; No. 47, \$1.50; No. 48, \$1.50; No. 49, \$1.50; No. 50, \$1.50; No. 51, \$1.50; No. 52, \$1.50; No. 53, \$1.50; No. 54, \$1.50; No. 55, \$1.50; No. 56, \$1.50; No. 57, \$1.50; No. 58, \$1.50; No. 59, \$1.50; No. 60, \$1.50; No. 61, \$1.50; 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No. 419, \$1.50; No. 420, \$1.50; No. 421, \$1.50; No. 422, \$1.50; No. 423, \$1.50; No. 424, \$1.50; No. 425, \$1.50; No. 426, \$1.50; No. 427, \$1.50; No. 428, \$1.50; No. 429, \$1.50; No. 430, \$1.50; No. 431, \$1.50; No. 432, \$1.50; No. 433, \$1.50; No. 434, \$1.50; No. 435, \$1.50; No. 436, \$1.50; No. 437, \$1.50; No. 438, \$1.50; No. 439, \$1.50; No. 440, \$1.50; No. 441, \$1.50; No. 442, \$1.50; No. 443, \$1.50; No. 444, \$1.50; No. 445, \$1.50; No. 446, \$1.50; No. 447, \$1.50; No. 448, \$1.50; No. 449, \$1.50; No. 450, \$1.50; No. 451, \$1.50; No. 452, \$1.50; No. 453, \$1.50; No. 454, \$1.50; No. 455, \$1.50; No. 456, \$1.50; No. 457, \$1.50; No. 458, \$1.50; No. 459, \$1.50; No. 460, \$1.50; No. 461, \$1.50; No. 462, \$1.50; No. 463, \$1.50; No. 464, \$1.50; No. 465, \$1.50; No. 466, \$1.50; No. 467, \$1.50; No. 468, \$1.50; No. 469, \$1.50; No. 470, \$1.50; No. 471, \$1.50; No. 472, \$1.50; No. 473, \$1.50; No. 474, \$1.50; No. 475, \$1.50; No. 476, \$1.50; No. 477, \$1.50; 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Pinking irons—

See Irons, Pinking.

Pins, Escutcheon—

Brass 50¢ @ 50¢ & 10%
 Iron, list Nov. 11, '85. 60¢ @ 60¢ & 10%

Pipe, Cast Iron Soil—

Standard 2-6 in. 60¢ @ 60¢ & 10%
 Extra Heavy, 2-6 in. 70¢ @ 60¢ & 10%
 Fittings, Standard and Heavy,
 75¢ @ 75¢ & 10%

Pipe, Merchant—

Consumers, Carloads.		Steel.		Iron.	
Bk. Galv.	Bk. Galv.	Bk. Galv.	Bk. Galv.	Bk. Galv.	Bk. Galv.
1/2 & 3/4 in.	63	63	63	63	63
3/4 in.	66	66	66	66	66
1 in.	68	68	68	68	68
1 1/4 to 6 in.	72	72	70	70	70
7 to 12 in.	69	69	67	67	67

Pipe, Vitrifired Sewer—

Carload lots.
 Standard Pipe and Fittings, 3
 to 24 in., f.o.b. factory:
 First-class 87%
 Second-class 90%

Pipe, Stove—

Per 100 joints.		C. L. C. L.	
Edwards' Nested:			
5 in., Standard Blue	\$6.25	\$1.25	
6 in., Standard Blue	6.75	1.25	
7 in., Standard Blue	7.75	1.25	
5 in., Royal Blue	7.00	8.00	
6 in., Royal Blue	7.50	8.50	
7 in., Royal Blue	8.50	9.50	
Wheeling Corrugating Co.'s Nested:			
5 in., Uniform Color	\$6.15	\$1.15	
6 in., Uniform Color	6.65	1.65	
7 in., Uniform Color	7.65	8.65	

Planes and Plane Irons—**Wood Planes—**

Bench, first qual. 30¢ @ 30¢ & 10%
 Bench, second qual. 40¢ @ 40¢ & 10%
 Molding 25¢ @ 25¢ & 10%
 Chapin-Stephens Co.:
 Bench, First Quality 30%
 Bench, Second Quality 40%
 Molding and Miscellaneous 25%
 Toy and German 30%
 Union 60%

Iron Planes—

Chapin's Iron Planes 50¢ & 10%
 Union 60%

Plane Irons—

Wood Bench Plane Irons, list
 Dec. 12, '06. 25%
 Buck Bros. 30%
 Chapin-Stephens Co. 50%
 Union 60%
 L. & I. J. White 20¢ & 5¢ @ 25%

Planters, Corn, Hand—

Kohler's Eclipse 40¢ doz. \$8.00

Plates—

Feloe 1 lb. 4¢ @ 4¢ & 10%

Pliers and Nippers—

Button Pliers 75¢ @ 75¢ & 10¢ & 5%
 Gas Burner, per doz. 5 doz. \$1.25
 @ \$1.30; 6 in., \$1.45 @ \$1.50.
 Gas Pipe, 7 8 10 12 in.
 \$2.00 \$2.25 \$2.75 \$3.50

Acme Nippers 50¢ & 5%
 Cronk & Carrier Mfg. Co.:
 American Button 60%
 Improved Button 75¢ & 10%
 Cronk's 50%
 No. 80 Linemen's 50%
 Stub's Pattern 45%
 Combination and others 35%
 Heller's Farmers' Nippers, Pincers
 and Tools 40¢ & 5¢ @ 40¢ & 5%
 P. S. & W. Timmers' Cutting Nip
 per 40%
 Wm. Schollhorn Co.:
 Bernard, 35%; Elm City, 35%;
 Paragon, 50%; Lodi, 55%
 Swedish Side, End and Diagonal Cut-
 ting Pliers 50%
 Utica Drop Forge & Tool Co.:
 Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:
 Plumbs and Levels 30¢ @ 30¢ & 10%
 Chapin's Imp. Brass Cor. 40¢ @ 40¢ & 10%
 Pocket Levels 30¢ @ 30¢ & 10%
 Extension Sights 30¢ @ 30¢ & 10%
 Machine Levels 40¢ @ 40¢ & 10%
 Diston's Plumbs and Levels 60¢ & 10%
 Diston's Pocket Levels 60¢ & 10%
 Stanley's Duplex 30%
 Woods' Extension 35%

Points, Glaziers'—

Rulk and 1-lb. papers 1 lb. 9¢
 1/4-lb. papers 1 lb. 9¢
 1/4-lb. papers 1 lb. 10¢

Police Goods—

Manufacturers' Lists 25¢ @ 25¢ & 5%
 Tower's 25%

Polish—Metal, Etc—

Prestoline Liquid, No. 1 (1/4 pt.)
 \$3.00; No. 2 (1 qt.) \$9.00, 40%
 Prestoline Paste 10%

George William Hoffman:
 U. S. Metal Polish Paste, 3 oz.
 boxes, 50¢; 1/2 doz. \$1.50;
 1/2 lb boxes, 50¢ doz. \$1.50;
 1 lb boxes, 50¢ doz. \$2.25.
 U. S. Liquid, 8 oz. cans, 50¢ doz.,
 \$1.25.
 Barkeepers' Friend Metal Polish, 50¢
 doz., \$1.75.

Stove—

Black Eagle Benzine Paste, 5 lb. cans,
 50¢ doz. \$1.50;
 Black Eagle, Liquid, 1/4 pt. cans,
 50¢ doz. \$1.50;
 Black Jack Paste, 5 lb. cans, 50¢ doz. \$1.50;
 Black Kid Paste, 5 lb. cans, 50¢ doz. \$1.50;
 Ladd's Black Beauty Liquid, per
 100 tins \$6.75
 Joseph Dixon's, 50¢ gr. \$5.75 10%
 Dixon's Plumbago, 50¢ gr. \$5.75 10%
 Fireside 50¢ gr. \$5.75 10%
 Gem, 50¢ gr. \$1.50 10%
 Japanese 50¢ gr. \$3.50 10%
 Jet Black 50¢ gr. \$3.50 10%
 Peerless Iron Enamel, 10 oz. cans,
 50¢ doz. \$1.50

Poppers, Corn—

1 qt. Square, doz. \$0.80; gro. \$8.75
 1 qt. Round, doz. \$0.90; gro. \$10.00
 1 1/2 qt. Square, doz. \$1.00; gro. \$11.00
 2 qt. Square, doz. \$1.25; gro. \$13.50

**Post Hole and Tree Aug-
ers and Diggers—**

See also Diggers, Post Hole, &c.

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢;
 6 ft., 46¢; 6 1/2 ft., 46¢.
 Steel Hitching Posts each \$1.30

Potato Parers—

See Parers, Potato.

Pots, Glue—

Enameled 35¢ @ 10%
 Tinned 30¢ @ 10%

Powder—

In Canisters:
 Duck, 1 lb. each 45¢
 Fine Sporting, 1 lb. each 75¢
 Rifle, 1/2 lb. each 16¢
 Rifle, 1 lb. each 25¢
 In Kegs:
 12 1/2-lb. kegs \$3.50
 25-lb. kegs \$4.50
 King's Semi-Smokeless:
 Keg (25 lb. bulk) \$6.50
 Half Keg (12 1/2 lb. bulk) \$3.50
 Quarter Keg (6 1/4 lb. bulk) \$1.90
 Case 21 (1 lb. cans bulk) \$8.50
 Half case (1 lb. cans bulk) \$4.50
 King's Smokeless:
 Keg (25 lb. bulk) \$12.00 \$15.00
 Half Keg (12 1/2 lb. bulk) 6.25 7.75
 Quarter Keg (6 1/4 lb. bulk) 3.25 4.00
 Case 21 (1 lb. cans bulk) 14.00 17.00
 Half case 12 (1 lb. c. bk.) 7.25 8.75

Presses—**Fruit and Jelly—**

Enterprise Mfg. Co. 20¢ @ 25%

Seal Presses—

Morrill's No. 1, 1/2 doz., \$20.00 50%

Pruning Hooks and Shears**Use Shears.****Pullers, Nail—**

Cyclops 50%
 Miller's Falls, No. 3, 50¢ doz., \$12.00
 Morrill's No. 1, Nail Puller, 50¢ doz.
 Pearson No. 1, Cyclone Spike Puller,
 each \$30.00 50%
 The Scranton Co. Case Lots:
 No. 21 (large) 50%
 No. 3B (small) 50%
 Smith & Hemenway Co.:
 Diamond B. 70%
 Giant Puller, Utica and Davi-
 son 50%
 Staple Pullers, Utica and Davi-
 son 60%

Pulleys, Single Wheel—

Inch	1 1/2	2	3
Turning or Tackle,			
doz.	\$0.50	.45	.60
Hay Fork, Sicel or Solid Eye,			
doz., 4 in., 1 1/2, 5 in., 1 1/2			
Inch 2	1 1/2	2	3
Hot House, doz.	\$0.65	.85	1.80
Inch 1 1/2	2	3	
Screw, doz.	\$0.16	.19	.30
Inch 1 1/2	2	3	
Side, doz.	\$0.25	.40	.55
Inch 1 1/2	2	3	

Sash Pulleys—

Common Frame: Square or
 Round End, per doz, 1 1/2 and
 2 in. 17¢ @ 20¢
 Auger Mortise, no Face Plate,
 per doz, 1 1/2 and 2 in. 20¢ @ 21¢
 Acme, No. 35, 1 1/2 in., 19¢; 2 in., 20¢
 American Pulley Co.:
 Wrought Steel American Plain
 Axle 50¢ & 10%
 Wrought Steel, Eagle 17¢ @ 20¢
 Fox-All-Steel, Nos. 3 and 7, 2 in.,
 50¢ doz. 50%
 Grand Rapids All Steel Noiseless, 50%
 Niagara, No. 25, 1 1/2 in., 19¢; 2 in.,
 20¢
 No. 36, 2 in., 14¢; 2 1/2 in., 16¢
 Star, No. 26, 1 1/2 in., 19¢; 2 in., 20¢
 Tackle Blocks—See Blocks.

Pumps—

Cistern 60%
 Pitcher Spout 75¢ @ 75¢ & 10%
 Wood Pumps, Tubing, &c. 60%
 Barnes Dhl. Acting (low list) 40¢ & 5%
 Barnes Pitcher Spout 55¢ & 10%
 Contractors' Rubber Diaphragm No. 2
 R. & L. Block Co. 40%
 Daisy Spray Pump 50¢ doz. \$6.00

Flint & Walling's, Fast Mail Hand,
 (low list) 50%
 Flint & Walling's, Fast Mail (low
 list) 50%
 Flint & Walling's, Tight Top Pitcher,
 75¢ & 10%
 National Specialty Mfg. Co. Measur-
 ing, Nos. 2, \$6.00; 3, \$5.50 30%
 Myers' Pumps (low list) 40¢ & 5%
 Myers' Power Pumps 40¢ & 5%
 Myers' Spray Pumps 40¢ & 5%

Pump Leathers—

Plunger and Valve Leathers—Per
 gro.:

No.	1	2	3	4
	\$5.00	6.00	7.00	8.00

 Cup Leathers—Per 100:

Inch.	2 1/2	3	3 1/2	4
	\$5.00	7.00	9.00	12.00

 50%

Punches—

Saddlers' or Drive, good
 doz. 50¢ @ 75¢
 Spring, single tube, good qual-
 ity \$1.75
 Revolving (4 tubes) doz. \$3.50
 Adams & Call Co.'s Cast Stl. Drive
 Morrill's Nos. 1A, 1A, 1B, 1C,
 1D, \$15.00 50%
 Hercules, 1 die, each \$5.00 50%
 Niagara Hollow Punches 40%
 Niagara Solid Punches 55¢ & 10%
 Wm. Schollhorn Co.:
 Belt and Ticket, Bernard, 35%
 Paragon, 50%; Lodi 55%
 Timmers' Hollow, P. S. & W. Co. 40%
 Timmers' Solid, P. S. & W. Co. 40%
 doz., \$1.41 40%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron
 2 1/2 @ 2 1/2¢
 Sliding Door, Wrought Brass,
 1 1/2 in., lb., 36¢ 30%
 Allith Mfg. Co.: Reliable Hanger
 Track 50%
 Cronk's:
 Double Braced Steel Rail, 1/2 ft. 3/4¢
 O. N. T. Rail \$3.12
 Griffin's:
 100 ft., 1 x 3-16 in., \$3.25;
 1 1/2 x 3-16 in., \$3.75;
 Hinged Hanger, 100 ft., 1 x 3-16
 in., \$3.50; 1 1/2 x 3-16 in., \$4.00.
 Lane's:
 Hinged Track, 100 ft. \$3.45
 O. N. T., 1 1/2 x 3-16 in., \$3.00; 1 1/2
 x 3-16 in., \$3.45; 1 1/2 x 3-16 in., \$4.00.
 Standard, 1 1/2 in. 100 ft. \$4.00
 Lawrence Bros.:
 1 x 3-16 in., 100 ft., \$7.50; 1 1/2 x
 3-16 in., \$8.75 55¢ & 7 1/2%
 McKimney's:
 Hinged Hanger Track, 1/2 ft., 11¢
 1 x 3-16 Track 55¢ & 7 1/2%
 Myers' Stayon Track 60¢ & 5%
 Richards' Mfg. Co.:
 Common, 1 x 3-16 in., \$3.00; 1 1/2 x
 3-16 in., \$3.45; 1 1/2 x 3-16 in., \$4.00.
 Special Hinged Hanger Rail 60¢ & 10%
 Lag Screw Rail, No. 65 50%
 Gauge Trolley Track, 1/2 ft., No. 31,
 9¢; No. 32, 14¢; No. 33, 20¢.
 No. 50 60¢ & 10%
 No. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64,
 \$4.00; 65, \$3.25; 46, \$3.50; 49, No. 1,
 \$3.25; 49, No. 2, \$3.50.

Rakes—

NOTE—Many goods are sold
 at net prices.
 Fort Madison Red Head Lawn \$3.25
 Fort Madison Blue Head Lawn \$2.70

Cronk's:
 Steel Garden, Champion, 75%;
 Ideal, 80%; Victor 80% & 25%
 Queen City Lawn, 1/2 doz., 20 teeth,
 \$2.85; 24, \$3.00 net
 Anticlog Lawn, 1/2 doz. \$4.00
 Malleable Garden, 12 teeth 70% & 10%
 Ideal Steel Garden, 12 teeth
 \$15.00; 14, \$16.00; 16, \$18.00 80%
 Kohler's:
 Layn Queen, 20-tooth 30 doz. \$3.15
 Layn Queen, 24-tooth 30 doz. \$3.25
 Paragon, 20-tooth 30 doz. \$2.70
 Paragon, 24-tooth 30 doz. \$2.75
 Steel Garden, 14-tooth 30 doz. \$2.40
 Malleable Garden, 11-tooth, 1/2 doz.,
 \$2.00 @ 2.25

Rasps, Horse—

Diston's 75%
 Heller Bros. 70¢ & 5¢ @ 70¢ & 10%
 Liveright Bros. Gold Medal 70¢ & 10%
 McCaffrey's American Standard,
 60¢ & 10¢ & 5%
 New Nicholson 70¢ & 10%
 See also Files.

Razors—

Liana Bo-ras-ic 60%
 Fox Razors, 1/2 doz., No. 42, 50¢; 1/2
 No. 44, \$20.00; No. 82, Platina. }
 25.00 }
 Red Devil 65%

Reels, Fishing—

Hendryx:
 M. G. Q. 6, A. 6, B. 8, M. 9 1/4, M. 16,
 Q. 16, A. 16, B. 16, 4008, Rubber,
 Populo, Nickeled Populo 20%
 Aluminum German Silr., Bronze 25%
 1240 N, 124 N 20%
 3001 N, 3001 N, 6 RM, G. 9, 202 P,
 4 N, 6 PN, 24 N, 26 PN, 20%
 2001 P, 33 1/4, 2001 PN, 33 1/4, 0924 N,
 33 1/4, 02084 N, 33 1/4, 020904 PN,
 33 1/4, 002 N, 33 1/4
 006 PN, 2501 N, 374 PN 25%
 5009 PN, 5009 N 20%
 Competitor, 102 P, 102 PN, 202 P,
 202 PN, 102 PR, 202 PR 20%
 304 P, 304 PN, 00304 P, 00304 PN, 33 1/4

Registers—List July 1, 1903.

Japanned, Electroplated and
 Bronzed 70¢ @ 70¢ & 10%
 White Porcelain Enamel 50¢ & 10%
 Solid Brass or Bronze Metal 40%

Revolvers—

Single Action 85¢ @ \$1.00
 Double Action, except 44 cal. \$2.00
 Double Action, 44 caliber \$2.00
 Automatic \$4.00
 Hammerless \$4.50

Riddles, Hardware Grade

16 in. per doz. \$2.50 @ \$2.75
 17 in. per doz. \$2.75 @ \$3.00
 18 in. per doz. \$3.00 @ \$3.25

Rings and Ringers—

Bull Rings—

	2	2 1/2	3 inch.
Steel	\$0.70	0.75	0.80 doz.
Copper	\$1.10	1.25	1.65 doz.

 Hog Rings and Ringers—
 Hill's Rings, gro. boxes \$4.25 @ \$4.50
 Hill's Ringers, Gray Iron, doz.,
 60¢ @ 75¢
 Hill's Ringers, Malleable Iron,
 doz. 80¢ @ 95¢
 Blair's Rings, per gro. \$5.00 @ \$5.50
 Blair's Ringers, per doz. 75¢ @ 90¢
 Brown's Rings, per gro. \$5.25 @ \$5.50
 Brown's Ringers, per doz. 75¢ @ 90¢

Rivets and Burrs—

Copper 50%
 Carriage, Coopers', Timmers, &c.:
 Black 70¢ & 10%
 Metallic Tinned 70%

Bifurcated and Tubular—

Assorted in Boxes.
 Bifurcated, per doz. boxes, paste-
 board boxes, 50 count, 23¢ @ 25¢;
 Tin boxes, 100 count, 29¢ @ 32¢.
 Tubular, per doz. boxes, 50 count,
 29¢ @ 32¢; 100 count, 51¢ @ 58¢.

Rollers—

Cronk's Stay, No. 50 \$1.00
 Cronk's Brinkerhoff No. 55, \$0.60;
 No. 56, \$0.75; No. 60 \$0.75
 Lane's Stay 40%
 Richards' Stay 40%
 Handy Adj. and Reversible No. 53, 75¢
 O. K. Adj. and Reversible No. 58, 50¢
 Lag Screw, Nos. 55 and 57 50%
 Underwriters', Nos. 59, 60 50%
 Favorite, No. 54 60%

Rope—

Manila, 7-16 in. diam. and larger:
 Pure lb. 10 1/2¢ @ 11 1/2¢
 Sisal, 7-16 in. diam. and larger:
 Pure lb. 7 1/2¢ @ 8¢
 Sisal, 7-16 in. diam. and larger:
 No. 2 quality lb. 6 1/2¢ @ 7¢
 Sisal, 1/4 in. and larger and Buie
 Ropes, Medium and Coarse:
 Mixed lb. 6 1/2¢ @ 7¢
 Pure lb. 7 1/2¢ @ 8 1/2¢
 Sisal, Tarred, Medium Lath
 Yarn, Coarse and Untarred:
 Mixed lb. 5 1/4¢ @ 5 1/2¢
 Pure lb. 6 1/2¢
 Cotton Rope:
 Best, 1/4-in. and larger 18¢ @ 20¢
 Medium, 1/4-in. and larger 17¢
 Common, 1/4-in. and larger 10¢
 In coils, 1/2 advance.
 Jute Rope:
 Thread, No. 1, 1/4-in. & up, lb. 6 1/2¢
 Thread, No. 2, 1/4-in. & up, lb. 5 1/2¢

Wire Rope—

Saws—

Atkins' Circular	45%
Band	50@50.40
Butcher Saws	50
Cross Cuts	35
One-Man Cross Cut	40
Narrow Cross Cut	35.5
Hand, Rip and Panel	35.5
Miter Box and Compass	40
Mulay, Mill and Drag	45
Wood Saws	40.40
Chapin-Stephens Co.	
Turning Saws and Frames	30@30.10
Diamond Saw & Stamping Works	30
Sterling Kitchen Saws	30.10@10
Disston's:	
Circular, Solid and Ins'ted Tooth	50
Band, 2 to 18 in. wide	60
Band, 1/4 to 1 1/2	60
Crosscuts	45
Narrow Crosscuts	50
Mulay, Mill and Drag	50
Framed Woodsaws	25
Wood Saw Blades	25
Wood Saw Rods, Tinned	15
Hand Saws, Nos. 12, 9, 9, 16, d100	15
18, 120, 70, 71, 5	25
Hand Saws, Nos. 1, 107, 107 1/2, 3, 1	30
0, 00, Combination	30
Compass, Key Hole, &c.	30
Butcher Saws and Blades	30
C. E. Jennings & Co.'s:	
Back Saws	16%
Butcher Saws	25.75
Compass and Key Hole Saws	33.75
Framed Wood Saws	25.75
Hand Saws	12%
Wood Saw Blades	33.75
Mullers Falls:	
Butcher Saws	15.40
Star Saw Blades	15.40
Massachusetts Saw Works:	
Victor Kitchen Saws	40.10@50
Butcher Saws Blades	35@40
Peace & Richardson's Hand Saws	30
Simonds':	
Circular Saws	45%
Crescent Ground Cross Cut Saws	30
One-Man Cross Cuts	40.10
Gang Mill, Mulay and Drag Saws	45
Hand Saws	40
Back Saws	25.75
Butcher Saws	35@35.75
Hand Saws	25.75
Hand Saws, Bay State Brand	45
Compass, Key Hole, &c.	25.75
Wood Saws	40.75
Wheeler, Madden & Clemens	50
Co.'s Cross Cut Saws	50

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A & A	25
Disston's:	
Concave Blades	25
Keystone Blades	35
Hack Saw Frames	30
Simonds' File Co.	35
C. E. Jennings & Co.'s:	
Hack Saw Frames, Nos. 175, 180	40.75
Hack Saws, Nos. 175, 180, complete	40.75
Goodell's Hack Saw Blades	40.10
Griffin's Hack Saw Frames	35.5
Griffin's Hack Saw Blades	35.5
Star Hack Saw Blades	15.40
Sterling Hack Saw Blades	30.10@10
Sterling Hack Saw Frames	30.10@10
Sterling Power Hack Saw Machines	
each, No. 1, \$25.00; No. 2, \$30.00	10
Victor Hack Saw Blades	20
Victor Hack Saw Frames	40
Whitaker Mfg. Co.:	
National Hand Blades	40
National Hand Frames	30.5
National Power Blades	30.10

Scroll—

Barnes, No. 1, \$15	25
Barnes' Scroll Saw Blades	40
Barnes' Velocipede Power Scroll Saw	
without boring attachment, \$18	
with boring attachment, \$20	25
Lester, complete, \$10.00	15.10
Rogers, complete, \$9.50 and \$4.00	15.10

Scales—

Family, Turnbull's	50@50.10
Counter:	
Hatch, Platform, 1/2 oz. to 4 lbs.	50 doz., \$5.50
Two Platforms, 1/2 oz. to 8 lbs.	50 doz., \$16.00
Union Platform, Plain \$1.70@1.90	
Union Platform, Std. \$1.85@2.15	
Chatillon's:	
Eureka	25
Favorite	40
Crocker's Trip Scales	50
The Standard Portables	50
The Standard R. R. and Wag-	
on	50@50.10

Scrapers—

Box, 1 Handle	50 doz., \$2.00@2.25
Box, 2 Handle	50 doz., \$2.50@2.75
Ship	Light, \$2.00; Heavy, \$1.50
Chapin-Stephens Co., Box	30@30.10
Richards Mfg. Co., Foot	60

Screws—Bench and Hand

Bench, Iron, doz., 1 in.	\$2.50
2 1/2; 1 1/2, \$3.00@3.25; 1 1/4, \$3.50@3.75	
Bench, Wood	20@20.10
Hand, Wood	70@70.10
Chapin-Stephens Co., Hand	70@70.10

Coach, Lag and Hand Rail—	
Lag, Cone Point	80@80.45
Coach, Gimlet Point	
Hand Rail	75@75.10

Jack Screws—

Standard List	70@70.10
Millers Falls	50@50.10
Sweet Iron Works	70@75

Machine—

Cut Thread, Iron, Brass or Bronze:	
Flat Head or Round Head	50@50.10
Fillister Head	40@40.10

Rolled Thread, F. H. or R. H.	75@10
F. H. or R. H., Brass, Nos. 8 to 14	65@10

Set and Cap—

Set (Iron)	75@10.75
Set (Steel), net advance over Iron	25
Sq. Hd. Cap	70@10.75
Hex. Hd. Cap	70@10.75
Rd. Hd. Cap	50@7.5
Fillister Hd. Cap	60@7.5

Wood—

List July 23, 1903:	
Flat Head, Iron	87.45@
Round Head, Iron	85.45@
Flat Head, Brass	80.45@
Round Head, Brass	77.45@
Flat Head, Bronze	75.45@
Round Head, Bronze	72.45@
Drive Screws	87.45@

Scroll Saws—

See Saws, Scroll.

Scythes—

Grass, No. 1, Plain	\$7.00@7.50
Clipper, Bronzad Webb	\$7.25@7.75
No. 3 Clipper, Pol'd Webb	\$7.50@8.00
No. 6 Clipper and Solid Steel	\$7.75@8.25
Bush, Weed and Bramble, Nos. 11, 12 and 13	\$7.25@7.75
Grain, No. 1	\$9.00@9.50
Bronzed Webb, No. 1	\$9.25@9.75
Nos. 3 and 4 Clipper, Grain	\$9.50@10.00
Solid Steel, No. 6	\$10.00@10.50

Seeders, Raisin—

Enterprise	25@30
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Sets— Awl and Tool—

Fray's Adj. Tool Handles, No. 1, \$12; 2, \$18; 3, \$12; 4, \$9; 5, \$7	
Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18.20@10	

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel	\$9 doz sets \$9.00
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Sets, Nail—

Octagon	gro. \$3.50@3.75
Huck Bros.	27%
Cannon's Diamond Point	\$12
Mayhew's	\$9.50
Snell's Corrugated, Cup Pt.	40.10
Snell's Knurled, Cup Pt.	40.10
Victor Knurled Cup Pt.	\$7.50

Rivet—

Regular list	75@75.10
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Saw—

Atkin's:	
Criticism	40
Adjustable	40
Disston's Star, Monarch and Triumph	30
Morrill's No. 1	\$15.00
Nos. 3 and 4, Cross Cut	\$20.00
No. 5, Mill	\$30.00
No. 10, 11, 12	\$15.00
No. 1, Old Style	\$10.00
Special	\$16.25
Giant Royal Cross Cut	\$9 doz. \$8.00
Royal, Hand	\$9 doz. \$4.50
Taintor Positive	\$9 doz. \$4.75

Shaving—

Fox Shaving Sets, No. 30	\$4 doz., net, \$24.00
Smith & Hemenway Co.'s	75

Sharpeners, Knife—

Pike Mfg. Co.:	
Fast Cut Pocket Knife Hones	\$1.50
Mounted Kitchen Sand Stone	\$1.50
Natural Grit Carving Knife Hones, \$ doz.	\$3.00
Quick Cut Emery Carving Knife Hones, \$ doz.	\$1.50
Quick Edge Pocket Knife Hones, \$ doz.	\$2.50

Skate—

Smith & Hemenway Co., Eureka	50%
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Shaves, Spoke—

Iron	doz. \$1.25
Wood	doz. \$2.00
Bailey's (Stanley R. & L. Co.)	45
Chapin-Stephens Co.	30@30.10
Goodell's	\$9.00

Shears—

Cast Iron	7 8 9 in.
Best	\$16.00 18.00 20.00 gro.
Good	\$13.00 15.00 17.00 gro.
Cheap	\$5.00 6.00 7.00 gro.
Straight Trimmers, &c.:	
Best quality Jap.	70@70.10
Best quality Nickel	60@60.10
Tailors' Shears	40@40.10
Acme Cast Shears	40@40.10
Heinrich's Tailor's Shears	10
Wilkinson Shear & Cutlery Co.	
Sheep, 1900 list	30@30.10
Grass	50@50.10
Horse or Mule	50@50.10
J. Wiss & Sons Co.:	
Best Quality Jap'd	60@60.10
Best Quality Nickel'd	50@50.10
Tailors'	25

Tinners' Snips—

Steel Blades	20.5@20.10
Steel & Yd Blades	40@40.10

Forged Handles, Steel Blades, Berlin	50
Heinrich's Snips	40
Jennings & Griffin Mfg. Co.'s 6 1/2 to 10 in.	33.75
Niagara Snips	40
P. S. & W. Forged Handles	25
W. R. W.	40.10
J. Wiss & Sons Co.:	
Wiss Forged Steel	25

Pruning Shears—

Cronk's Hand Shears	33%
Cronk's Wood Handle Shears	33%
Disston's Combined Pruning Hook and Saw, \$ doz.	\$18.00
Disston's Pruning Hook only, \$ doz.	\$12.00
John T. Henry Mfg. Co.:	
Pruning Shears, all grades	40
P. S. & W. Co.	40.10
Columbian Cutlery Co.	
Hedge, Wilcut Brand	60.10
Lawn and Border, Wilcut Brand	60.10

Sheaves—Sliding Door—

Reading	40
R. & E. list	15

Sliding Shutter—

Reading list	40
R. & E. list	10

Shells—Shells, Empty—

Brass Shells, Empty:	
Climax, 10 and 12 gauge	65.10
Club, Rival, 65.5; First Quality	60.5

Paper Shells, Empty—

New Rapid, 10, 12, 16 and 20 gauge	25.10
Climax, 10 and 12 gauge: Acme, 10, 12, 16 and 20 gauge: Ideal, 10, 12, 16 and 20 gauge: Leader grade	25.5
Union, League, 12 and 12 gauge:	
Rival Grade	25
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge: Climax, 11, 12, 14, 16 and 20 gauge: League, Union, 14, 16 and 20 gauge: Repeater Grade	20

Shells, Loaded—

Loaded with Black Powder	40%
Loaded with Smokeless Powder, medium grade	40.5
Loaded with Smokeless Powder, high grade	40.10@10
Union Metallic Cartridge Co.:	
New Club, Black Powder	40
Nitro Club, Smokeless Powder	40.5
Arrow, Smokeless Powders	40.10@10
Winchester:	
Smokeless Repeater Grade	40.5
Smokeless Leader Grade	40.10@10
Black Powder	40

Shingles, Metal—Per Sq.

Edwards Mfg. Co.:	
Painted	
14 x 20	\$1.25
10 x 14	4.50
7 x 10	4.75
Galv.	
14 x 20	6.25
10 x 14	6.50
7 x 10	6.75
Wheeling Corrugating Co.:	
Dixie, 14 x 20 in.	\$1.25
Dixie, 10 x 14 in.	4.50
Dixie, 7 x 10 in.	5.00

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:	
Iron	per keg \$4.10
Steel	per keg \$3.85
Burden's, all sizes	\$3.90

Shot—

Drop, up to B.	25-lb. bag, \$1.85
Drop, B and larger	2.10
Buck	2.10
Chilled	2.10
Dust	2.30

Shovels and Spades—

Association List, Nov. 15, 1902	40
Avery Stamping Co.	40

Snow Shovels—

Long Handle	\$3.25@3.50
Wood and Mail, D. Handle	\$3.75@4.00

Sieves and Sifters—

Hunter's Imitation	gro. \$9.50@10.00
Hunter's Genuine	per gro. \$12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each	\$3.25
\$ doz.	\$39.00

Sieves, Seamless Metallic

Mesh	14 16 18 20
Iron Wire	\$1.05 1.05 1.10 1.20
Tinned Wire	\$1.15 1.15 1.20 1.30
Sieves, Wooden Rim—	
Nested, 10, 11 and 12 Inch.	
Mesh 18, Nested	doz. \$0.90@0.95
Mesh 20, Nested	doz. \$1.00@1.05
Mesh 24, Nested	doz. \$1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:	
12 x 12 to 22 x 36 in.	60
20 x 40 to 24 x 50 in.	50
24 x 60 to 24 x 120 in.	30
Barnes' low list:	
Up to and including 20 x 36 in.	50.5
20 x 40 to 24 x 50 in.	45

NOTE—There is not entire uniformity in lists used by jobbers.

Skins, Wagon—

Cast Iron	70@75.10
Steel	40@45

Slates, School—

Factory Shipments:	
"D" Slates	50@50.10
Eureka, Unexcelled Noiseless	60.5 tens
Victor A, Noiseless	60.4 tens 45

Slaw Cutters—See Cutters.

Snaps, Harness—

German	40@40.10
Covert Mfg. Co.:	
Derby, 25	Yankee, 30.2
Roller, 30.2	Yankee
High Grade, 40	Trojan
Jockey	40

Snaths—

Scythe	55@60
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Snips, Tinners—See Shears.

Scythe Stones—

Pike Mfg. Co., 1901 list:	
Black Diamond S. S.	gro. \$12.00
Lamolle S. S.	gro. \$11.00
White Mountain S. S. . . .	gro. \$9.00
Green Mountain S. S. . . .	gro. \$6.00
Extra Indian Pond S. S. . . .	gro. \$7.50
No. 1 Indian Pond S. S. . . .	gro. \$7.00
No. 2 Indian Pond S. S. . . .	gro. \$4.50
Leader Red End S. S. . . .	gro. \$1.50
Quick Cut Emery	gro. \$10.00
Pure Corundum	gro. \$18.00
Crescent	gro. \$7.00
Emery Scythe Rifles, 2 Coat, \$10	
Emery Scythe Rifles, 3 Coat, \$10	
Emery Scythe Rifles, 4 Coat, \$11	
Balance of 1904 list 33 1/2%	
Electro (Artificial), # gro.	33 1/2%
Lightning (Artificial), # gro.	33 1/2%
Lightning (Artificial), # gro.	33 1/2%

Stoppers, Bottle—

Victor Bottle Stoppers	gro. \$0.00
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Stops—Bench—

Millers Falls	154 10/100
Morrill's, # doz., No. 1, \$10.00	50
Morrill's, No. 2, \$12.50	50

Door—

Chapin-Stephens Co.	50@50@10%
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Plane—

Chapin-Stephens Co.	30%
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Straps—Box—

Acme Embossed, case lots, 20&10&10%	
Cary's Universal, case lots, 20&10&10%	

Stretchers, Carpet—

Cast Iron, Steel Points, # doz. 55¢	
All Steel Socket, # doz. \$2.00 @ 2.25	
Excelsior Stretcher and Tack Hammer Combined, # doz. \$4.00	20%

Stuffers, Sausage—

Enterprise Mfg. Co.	25@25&7 1/4%
National Specialty Co., list Jan. 1, 1902	30&45%
P., S. & W. Co.	40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co., # doz.	
Superba, Crucial Mahogany	\$36.00
Triumph, Fancy Veneers	\$33.00
Parlor Queen, Fig. Rosewood	\$30.00
Elite, Hungarian Ash	\$29.00
Am. Queen, Fig. Mahogany	\$27.00
Ideal, Bird's-Eye Maple	\$25.00
Grand Rapids, Nickel	\$24.00
Japan	\$22.00
Standard, Nickel, \$22.00; Japan \$20.00	
Crown Jewel, Nickel, \$21.00; Jap. \$19.00	
Crystal, Glass Top	\$36.00
Grand, 17 in. wide	\$36.00
Parlor Grand	\$48.00
Club, 24 in. wide	\$54.00
Hall, 28 in. wide	\$60.00

NOTE.—Rebates: 50¢ per dozen on three dozen lots; \$1 per dozen on five dozen lots; \$2 per dozen on ten dozen lots; \$2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks	90&40%
American Cut Tacks	90&40%
Suedes' Cut Tacks	90&40%
Suedes' Upholsterers'	90&40%
Gimp Tacks	90&40%
Lace Tacks	90&40%
Trimmers' Tacks	90&40%
Looking Glass Tacks	65%
Bill Posters' and Railroad Tacks	90&50&10%
Hungarian Nails	80&40%
Finishing Nails	70%
Trunk and Clout Nails	80&10%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks	90&6 tens @—%
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See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.: Gal. Gasoline Oil	
30 \$2.75 \$3.00	
60 \$5.50 \$6.00	
120 \$11.00 \$12.00	

Tapes, Measuring—

American Asses' Skin	50¢ @—%
Patent Leather	25@30&5%
Steel	35 1-3&5%
Chesterman's	25@25&5%
Kenell & Esser Co.: Favorite, Ass Skin	40&10@50%
Favorite, Duck and Leather	25&5@25&10%
Metallic and Steel, lower list, 35¢	
35&5%; Pocket, 35@35&5%	

Lufkin's: Asses' Skin	40&10@50%
Metallic	30@30&5%
Patent Bend, Leather	25&5@25&10%
Pocket	40@40&5%
Steel	33 1/4@35%

Wiebusch & Hilger: Chesterman's Metallic, No. 34L, etc.	25%
Chesterman's Steel, No. 1038L, etc.	35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, 1/4-inch and larger	per 100 lbs. \$2.75@3.00
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Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c.	30@33 1/2%
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Ties, Bale—Steel Wire—

Single Loop	80&10&5%
Monitor, Cross Head, &c. 70&2 1/2%	

Tinner's Shears, &c.—

See Shears, Tinner's, &c.

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See Benders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White	20@20&5%
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Haying—

Myers' Hay Tools	45%
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Miniature—

Smith & Hemenway Co.'s, Davidson, # doz., Nickel Plated, \$1.50;	
Gold Plated	\$2.00

Saw—

Atkins' Cross Cut Saw Tools	35&5%
Simonds' Improved	33 1/2%
Simonds' Crescent	35%

Ship—

L. & I. J. White	25%
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Transom Lifters—

See Lifters, Transom.

Traps—Fly—

Balloon, Globe or Acme, doz.	
\$1.15@1.25; gro.	\$11.50@12.00
Harper, Champion or Paragon, doz. \$1.25@1.40; gro. \$13.00@13.50	

Game—

Imitation Oneida	75&10%
Newhouse	45&45&5%
Hawley & Norton	65%
Victor	75@75&10%
Oneida Community Jump	10%
Hector	75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes	12¢
Mouse, Round or Square Wire, doz. 85¢@90¢	
Marty French Rat and Mouse Traps (Genuine): No. 1, Rat, # doz., \$13.25, \$11.50 doz. No. 3, Rat, # doz., \$6.50, \$5.75 doz. No. 3 1/2, Rat, # doz., \$5.25, \$4.70 doz. No. 4, Mouse, # doz., \$3.85, \$3.00 doz. No. 5, Mouse, # doz., \$3.00, \$2.25 doz. Oneida Community: Out o' Sight, Mouse, # doz. \$0.60 Out o' Sight, Rat, # doz. 1.25 Easy Set, Mouse, # doz.35 Easy Set, Rat, # doz. 1.00 Wood Choker, Rat, # doz. holes, .12 Premier Tin Choker, 5 hole, # doz. traps75	

Trowels—

Disston Brick and Pointing	25%
Disston Plastering	20%
Disston "Standard Brand" and Garden Trowels	30%
Kohler's Steel Garden Trowels, # gro., 5 in. \$4.80; 6 in. \$6.00.	
Never-Break Steel Garden Trowels . . .	\$4.00
Woodrough & McParlin, Plastering . .	25%

Trucks, Warehouse, &c.—

B. & L. Block Co.: New York Pattern	50&10%
Western Pattern	60&10%
Handy Trucks	# doz. \$18.00
Grocery	# doz. \$15.00
McKinney Trucks	each, net \$10.00
Model Store Trucks	# doz. \$18.50

Tubs, Wash—

M'fgr's list, price per gross. No. 0 1 2 3	
Galvanized \$67 \$79 \$89 \$99 10&10%	

Twine, Miscellaneous—

Flax Twine: No. 9, 1/4 and 1/2-lb. Balls, 23@25¢ No. 12, 1/4 and 1/2-lb. Balls, 21@23¢ No. 18, 1/4 and 1/2-lb. Balls, 18@20¢ No. 24, 1/4 and 1/2-lb. Balls 17 1/4@19 1/4¢ No. 36, 1/4 and 1/2-lb. Balls, 17@19¢ Chalk Line, Cotton 1/4-lb. 26@31¢ Cotton Mops, 6, 9, 12 and 15 lb. to doz. 11@19¢ Cotton Wrapping, 5 Balls to lb., according to quality 15 1/2@23¢ American 2-Ply Hemp, 1/4 and 1/2-lb. Balls 14 1/2@15 1/2¢ American 3-Ply Hemp, 1-lb. Balls 15 1/2@16 1/2¢ India 2-Ply Hemp, 1/4 and 1/2-lb. Balls (Spring Twine) 10 1/2@11 1/2¢ India 3-Ply Hemp, 1-lb. Balls 10 1/2@11 1/2¢ India 3-Ply Hemp, 1 1/2-lb. Balls 10@11¢ 2, 3, 4 and 5-Ply Jute, 1/4-lb. Balls . . . 13 1/2@14 1/2¢ Mason Line, Linen, 1/2-lb. Bls. 37¢ No. 26 1/2 Mattress, 1/4 and 1/2-lb. Balls, according to quality 30@60¢ Wool, 3 to 6 ply B 9¢; A 10¢	
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Vises—

Solid Box	50&5@50&10&5%
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Parallel—

Athol Machine Co.: Simpson's Adjustable	40%
Standard	40%
Amateur	25%
Columbian Hdw. Co.	40%
Fisher & Norris Double Screw, net each, Nos. 2, \$10.50; 3, \$16.00; 4, \$20.50; 5, \$27.00.	
Fulton Mach. & Vise Co.: Reed, Swivel	25%
Star Solid Jaw	45%
Holland	40@40&5%
Machinists'	65&5@70%
Keystone	30%
Lewis Tool Co.: Adjustable Jaw	30%
Monarch, 50%; Solid Jaw	50%
Massey Vise Co.: Climber	40%
Perfect, 15%; Lightning Grip	15%
Merrill's	20%
Millers Falls Oval Slide Pattern, 60&10%	
Parker's: 20@25%; Regulars 20@25%	
Vulcan's	40&45%
Combination Pipe	55@60%
Prenit	20@25%
Rock Island	25%
Snediker's X. L.	33 1/4%
Stephens'	33 1/4%

Saw Filers

Disston's D 3 Clamp and Guide, # doz., \$24.00, 30%; Clamps	30%
Perfection Saw Clamps, # doz. \$4.50	
Reading	60%

Wood Workers—

Fulton Mach. & Vise Co.: Reed	25%
Star	40&45%
Massey Vise Co.: Lightning Grip, 15%; Perfect	15%
Wyman & Gordon's Quick Action, 6 in., \$6.00; 9 in., \$7.00; 14 in., \$8.00.	

Miscellaneous—

Holland's Combination Pipe, 60@60&5%	
Massey's Quick Action Pipe	40%
Parker's Combination Pipe: 87 Series, 60%; 187 Series, 60&5%; No. 870 40%.	
Rock Island Pipe	25%

Wads—Price per M.

B. E., 11 up	60¢
B. E., 9 and 10	70¢
B. E., 8	80¢
B. E., 7	80¢
P. E., 11 up	\$1.00
P. E., 9 and 10	1.25
P. E., 8	1.50
P. E., 7	1.50
Ely's B. E., 11 and larger \$1.70@1.75	
Ely's P. E., 12 to 20	\$3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware: Enameled	45&10%
Ground	50&5%
Plain or Unground	60%
Country Hollow Ware, per 100 lbs.	\$3.00
White Enameled Ware: Maslin Kettles	65&10%
Covered Wares: Tinned and Turned	35&10%
Enameled	45&10%
See also Pots, Glue.	

Enameled—

Agate Nickel Steel Ware	33 1/4%
Iron Clad Ware	70&10%
Lava and Volcanic, Enameled	40&10%

Tea Kettles—

Galvanized Tea Kettles: Inch 6 7 8 9	
Each	48¢ 50¢ 55¢ 65¢

Steel Hollow Ware—

Avery Spiders and Griddles, 65@65&5%	
Avery Kettles	60%
Perforated	60&50&10%
Never Break Spiders and Griddles . . .	65&5%
Never Break Kettles	60%
Solid Steel Spiders and Griddles, 65&5%	
Solid Steel Kettles	60%

Warmers, Foot—

Pike Mfg. Co., Soapstone	40@40&10%
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Washboards—

Solid Zinc: Crescent, family size, bent frame, \$1.05	
Red Star, family size, stationary protector	\$1.05
Double Zinc Surface: Saginaw Globe, family size, stationary protector	\$3.55
Cable Cross, family size, stationary protector	\$3.60
Single Zinc Surface: Nalad, family size, open back	\$3.00
Single Saginaw Globe	\$2.85
Brass Surface: Brass King, Single Surface, open back	\$1.05
Nickel Plate Surface: No. 1001 Nickel Plate, Single Sur. . . .	\$3.60
Glass Surface: Glass King, Single Surface, open back	\$3.95
Enamel Surface: Enamel King, Single Surface, vent. lated back	\$3.95

Washers—Leather, Axle—

Solid	90@90&10%
Patent	90@90&5%
Coll: 1/8 1 1 1/4 1 1/2 inch. 9¢ 10¢ 11¢ 13¢ per box	

Iron or Steel—

Steel bolt	5-16 3/4 1/2 2 1/2 3 1/2
Washers	\$1.65 3.75 2.25 2.25 2.05
The above prices are based on \$6.75 off list.	
In lots less than one keg add 1/2¢ per lb.; 5-lb. boxes add 1/2¢ to list.	

Cast Washers—

Over 1/4 inch, barrel lots	per lb. 1 1/4@2¢
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Wedges—

Oil Finish	lb., @ 3¢
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Weights—Hitching—

Covert Mfg. Co.	30&2%
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Sash—

Per net ton, f.o.b. factory: Eastern District	\$25.00@28.00
Southern Territory	\$22.00@24.50
Western and Central Districts	\$22.50@23.50

Wheels, Well—

8-in., \$2.00; 10-in., \$2.15; 12-in., \$3.25; 14-in., \$1.45.	
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Wire and Wire Goods—

Bright and Annealed: 6 to 9	72&10&7 1/2%
10 to 18	72 1/2@10&10%
19 to 26	75&10&10&2 1/2%
27 to 36	77 1/2@7 1/2%

Galvanized:

6 to 9	72 1/2@10%
10 to 14	72 1/2@10&5%
15 to 16	72 1/2@10&5%
17 to 18	72 1/2%
19 to 26	70&

